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# **A Review of the Department of Transportation's Storm Water Management Program**



Prepared by the  
California Department of Finance  
Performance Review Unit

**NOVEMBER 10, 2003**

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# Executive Summary

This report was undertaken to provide a basis for understanding the Department of Transportation's (Caltrans') growing costs of compliance with law, regulation, and court orders governing storm water discharges from the state highway system.

The federal Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States. A National Pollutant Discharge Elimination System (NPDES) permit is required for the discharge of any pollutant or combination of pollutants under specified conditions. The federal act allows state governments to administer the NPDES Permit Program instead of the United States Environmental Protection Agency. California's Porter-Cologne Water Quality Control Act administered by the State Water Resources Control Board provides a legal and regulatory framework for water quality control that is more comprehensive than the federal act. Rather than operate separate State and federal programs in California, the State Water Resources Control Board received approval to implement portions of the Clean Water Act that include water quality permitting. This has involved melding State and federal processes together for activities such as setting water quality standards, issuing discharge permits, and operating the grants program.

Storm water discharges became subject to the Clean Water Act in 1987, with clear application to state road systems beginning in the early 1990s. Later phases of federal regulation have extended permitting requirements to smaller projects, including smaller transportation projects.

Caltrans has a statewide permit that establishes conditions, requirements, and prohibitions that apply throughout the state and within each of the nine Regional Water Quality Control Boards' (regional boards) jurisdictions. The statewide permit is administered, monitored, and tracked by the State Water Resources Control Board, while the provisions of the permit

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are implemented and enforced by the regional boards. Each of the regional boards is responsible for protecting water quality in specific water basins and has its own regulatory requirements, making it more challenging for Caltrans to develop and implement policies and directives that are consistent throughout the state. This is in contrast to other municipalities, whose boundaries typically fall within one or possibly two of the regional boards' purview, the statewide permit is the result of a 1996 request made by Caltrans.

Caltrans' statewide permit requires the development and implementation of a Storm Water Management Plan, which affects many of the significant functional areas (design, construction, maintenance, environmental, right-of-way, and operations) within Caltrans. The regulatory requirements of the statewide permit necessitate substantial coordination and training to integrate compliance activities throughout Caltrans operations. Given the size of Caltrans operations, implementing the requirements of the statewide permit, and therefore its storm water management plan, has been a major undertaking from the standpoint of changing the manner in which the department conducts its core business, i.e., building and maintaining highways. As with any major adjustment in core activities, the required changes have been met at times with incomplete understanding and some resistance. The department has attempted to address this resistance by conducting more training on program requirements as well as updating manuals and operational handbooks to include storm water requirements.

As compliance costs increase, most NPDES permittees are required to make difficult allocation choices relative to the use of limited resources. Some permittees have questioned whether the costs of compliance exceed the "maximum extent practicable" provisions of the NPDES program for municipal storm water discharges. The potential costs of compliance often were the first line of defense against implementing what administrators perceived as costly program changes. To date it does not appear that legal challenges or regulatory appeals have been successful in arguing that storm water compliance is too costly and therefore should be scaled back.

The costs to comply with Caltrans' Storm Water Management Program have substantially affected the cost its operations. As transportation funds are expended for storm water compliance, the amount of funds available for constructing transportation projects is reduced by that amount.

The balance between costs and benefits is a difficult storm water program implementation issue, but there needs to be a recognition of the trade-offs associated with resource

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allocation decisions given limited resources. While there is no doubt that there are definite benefits to improving our State's waters, there is an offsetting reduction in Caltrans' ability to maintain and expand the State's transportation system.

This report contains 14 findings which include recommendations that Finance believes will improve Caltrans management of its Storm Water Management Program.

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# Introduction

Beginning in fiscal year 1999-2000, Caltrans started submitting annual budget requests to fund storm water compliance efforts. Each year's request was larger than the last. In its review of these proposals, the Department of Finance (Finance) was advised by Caltrans to expect program costs to continue growing significantly and that Caltrans believed they had no meaningful control over costs. All this was occurring at the same time as a major policy push to address highway traffic congestion and city/county road maintenance. For two reasons, it seemed important to understand the long-term cost implications of the Department of Transportation's compliance with the federal and State requirements to reduce pollution in storm water runoff. First, since it looked like Caltrans would be continuing to ask annually to increase program costs, Finance needed to be able to advise the Legislature on the direction of the program. Second, transportation revenues grow rather slowly, and to the extent that storm water compliance costs outpace that growth, other transportation activities — such as highway capacity or traffic management systems — will grow at a lesser pace. As part of understanding long-term cost implications, Finance needed to know whether Caltrans was managing the program as effectively as it might. Hence, this report looks at (1) how the State has implemented the federal Clean Water Act, (2) how Caltrans administers its storm water compliance activities, (3) and how Caltrans' storm water program costs affect transportation funding sources.

The Department of Finance took an overall programmatic approach to the review. In that approach, all costs associated with the implementation of Caltrans' storm water program were considered storm water costs. This included costs associated with court directed activities, research, permit compliance, and costs of enforcement where there was non-compliance. It should be noted that the State Water Resources Control Board does not consider all of these expenditures as costs required to be expended to comply with the permit.

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# Methodology

Staff from the Performance Review Unit in Finance met with Caltrans and the State Water Resources Control Board (State Board) on the legal framework of the State's Storm Water Management Program and Caltrans' compliance efforts. Finance also interviewed Caltrans employees in Districts 3,4,7, and 11 directly involved in administering the program activities. These four districts were chosen because they have diverse topography, more stringent Regional Water Quality Control Board (regional board) requirements than other districts, they contain urban areas, or are involved in ongoing storm water lawsuits/consent decrees.

Finance also reviewed research reports and analyses, including studies conducted for the United States Environmental Protection Agency (USEPA) to evaluate the cost implications for achieving Clean Water Act requirements, and reports on the effectiveness of technologies used to prevent storm water pollution. Finally, Finance used the services of an environmental engineering and consulting firm to provide an analysis of published cost data and selected emerging issues in water quality compliance.

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# Background

The State's Storm Water Management Program is administered pursuant to both federal and State law. At the federal level, the program falls under the regulatory provisions of the National Pollution Discharge Elimination System (NPDES), established under Section 402 of the Clean Water Act. Administered by the United States Environmental Protection Agency (USEPA), the NPDES program is a permitting process that governs discharges into water bodies and is only one part of a complex regulatory scheme designed to meet the total requirements of the Clean Water Act. At the State level, the NPDES program is administered by the State Board in lieu of the USEPA. The California NPDES program is operated pursuant to the State's water quality control statutes, the Porter-Cologne Water Quality Control Act. The following is a general description of both the federal and State laws.

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## The Federal Clean Water Act

The Clean Water Act has its roots in the Water Quality Act of 1965, the Clean Water Restoration Act of 1966, and the Water Quality Improvement Act of 1970. In 1972, much of the prior language was replaced by the Federal Water Pollution Control Act—renamed in 1977 as the Clean Water Act—whose primary objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.

The Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and authorizes the USEPA to implement pollution control programs such as establishing wastewater standards for industry. The Act also continues requirements under previous law to set water quality standards for all contaminants in surface waters. The Act makes it unlawful for any person to discharge any pollutant

from a point source into navigable waters<sup>1</sup>, unless a NPDES permit is obtained under its provisions. A point source is "... any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture."<sup>2</sup> A NPDES permit allows the discharge of any pollutant or combination of pollutants if the discharges meet all the applicable provisions of the Act and the permit. The federal act allows state governments to administer the NPDES Permit Program instead of the USEPA including many of the permitting, administrative, and enforcement aspects program, but the USEPA retains oversight responsibilities. In addition to NPDES permits, Caltrans projects may also require permits issued by the Army Corps of Engineers under Section 404 of the Clean Water Act. The Army Corps of Engineers' approval is required when a project involves dredge or fill activities that may result in a discharge to U.S. surface waters pursuant to Section 404 of the Clean Water Act. Typically, U.S. surface waters are oceans or bays, lakes, rivers, creeks, their tributaries, and non-isolated wetlands.

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### Storm Water Discharges Become Subject to the Act

Under the NPDES program, regulations to improve water quality initially focused on reducing pollutants in discharges of industrial process wastewater and from municipal sewage treatment plants. Early efforts to address pollutant discharges were generally restricted to setting effluent limitations for wastewater treatment plants and industrial facilities.

A 1986 report to Congress<sup>3</sup> indicated that storm water runoff was a primary cause of pollution to the nation's waterways. This finding was based on an analysis of the extent to which all navigable waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water.<sup>4</sup>

Given the finding that storm water was a primary cause of pollution, Congress amended the Clean Water Act in 1987 to require the USEPA to establish NPDES requirements in phases for storm water discharges. This action implemented the requirement in a 1977 federal

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<sup>1</sup> Navigable waters is defined in U.S. Code, Title 33, Chapter 26, Subchapter V, Section 1362 (7) as waters of the United States including the territorial seas.

<sup>2</sup> Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977

<sup>3</sup> "The National Water Quality Inventory Report," June 1986. This report is the primary vehicle for informing Congress and the public about general water quality conditions in the United States. This document characterizes national water quality, identifies widespread water quality problems of national significance, and describes various programs implemented to restore and protect our waters.

<sup>4</sup> The USEPA reiterated this concern in its 1996 report entitled "Overview of the Storm Water Management Program," providing an assessment of the magnitude of impact. The report stated, "Roughly 46 percent of the identified cases of water quality impairment of estuarine square miles surveyed, for example, are attributable to storm water runoff."

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court order that storm water discharges be regulated as “point source” discharges under the NPDES program.

Being regulated as a point source, storm water discharges became subject to a broader array of pollution control requirements contained in the Clean Water Act. For example, discrete standards could be imposed that dictate the degree to which harmful chemicals could be present in discharges. These standards would be expressed as “effluent limits,” an example of a numeric effluent limit might be, “no outflow from a storm water system can contain more than x parts per million of zinc.” Therefore, effluent limits can be set for any pollutants found in storm water discharges. Generally, numeric effluent limits have not been developed for storm water discharges, rather effluent limits have been expressed as narrative best management practices.

In 1990, the USEPA promulgated the Phase I regulations of the federal Storm Water Management Program to address sources of storm water runoff with the greatest potential to degrade water quality. Under Phase I, the USEPA requires a NPDES permit for storm water discharges from medium and large municipal separate storm sewer systems located in incorporated cities or counties with populations of 100,000 or more. In addition, specific categories of industrial activity and construction activity that disturbs five or more acres of land also requires a NPDES permit. The industrial category includes transportation facilities, such as vehicle maintenance shops, equipment-cleaning operations, and those facilities that are involved in vehicle maintenance (e.g., transit bus/rail service, garbage service, airport services).

Initially it was unclear whether the permitting requirement for storm water discharges applied to highways. It was not until November 1990 that the USEPA issued final regulations that defined a municipal separate storm sewer to mean “a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains).” With this definition, state road systems became subject to NPDES Storm Water Permits.

On December 8, 1999, the USEPA issued Phase II regulations requiring permits for storm water discharges from small municipal separate storm sewer systems and from construction sites disturbing between one and five acres of land. The storm water discharge requirements that previously applied to only medium and large municipal separate storm sewer systems or to large construction projects became applicable to numerous small municipal separate storm sewer systems and small construction projects including transportation

projects. Affected entities had until March 10, 2003 to comply with the Phase II provisions by filing a Notice of Intent to obtain coverage under the applicable general permit.

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### California State Law: The Porter-Cologne Water Quality Control Act

In 1969, the State Legislature enacted the Porter-Cologne Water Quality Control Act, the basic water quality control law that mandates water quality objectives for all surface water and ground water in California. In 1972, this State Act was amended to conform to substantial changes in the federal Clean Water Act.<sup>5</sup> The State Act is administered by the State Water Resources Control Board (State Board) in conjunction with the nine regional boards.

The State Act creates a broad-based regulatory program designed to protect both water quality and beneficial uses. "Beneficial uses" refers to the resources, services, and uses of state waters that must be protected against quality degradation, which include, but are not limited to: agricultural, municipal, and domestic supply; recreation; and preservation and enhancement of fish and wildlife (see Appendix B for designated beneficial uses).<sup>6</sup>

The State Act imposes more comprehensive requirements on waste dischargers than the Clean Water Act. Whereas the NPDES permit regulates point sources discharging into surface (navigable) waters, the State regulates all sources of discharges into all waters, including ground water. State law is also broader than federal law for water quality control planning. Under the Porter-Cologne Act, water quality control plans or "basin plans" are adopted locally and become the framework for water quality control planning. The basin plans, which cover regional areas, establish the water quality standards for all waters covered by that plan, not just for point sources.

Water quality standards, which are adopted by either the State or the USEPA, are ambient standards for surface water bodies that prescribe the use of the water body and establish the water quality criteria that must be met to protect the designated (beneficial) uses. If the State adopts a standard that applies to surface waters, it is subject to approval by the USEPA. According to the USEPA, a water quality standard consists of four basic elements:

**Designated uses** (State term is beneficial uses) of the water body (e.g., recreation, water supply, aquatic life, agriculture),

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<sup>5</sup> By terms of Chapter 5.5 of the California Water Code, §13370 et.seq., the State also incorporates by reference existing and future changes in the Clean Water Act.

<sup>6</sup> North Coast Region Water Quality Control Plan, as adopted on December 9, 1993, Section 2-100



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**Water quality criteria** (State term is water quality objective) to protect designated uses (numeric pollutant concentrations and narrative requirements),

**Anti-degradation policy** (State term is non-degradation policy) requires that existing high-quality waters be protected and maintained, unless the need to lower water quality is justified, and

**General policies** addressing implementation issues (e.g., low flows, variances, mixing zones).

After the water quality objectives and beneficial use designations, etc., which apply to surface waters, are adopted by the State and approved by the USEPA, they become water quality standards under the federal Clean Water Act.

Water quality standards form the basis for establishing waste discharge requirements, waste discharge prohibitions, or minimum acceptable cleanup standards for all individuals and dischargers. The water quality standards, which are designed to protect both the existing and potential beneficial uses, can be both numeric and narrative descriptions. For example, a narrative description of a water quality objective is:

*“Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.”<sup>7</sup>*

In summary, beneficial uses, water quality standards, and water quality objectives form the basic foundation for water quality control under the provisions of the Porter-Cologne Water Quality Control Act.

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<sup>7</sup> North Coast Region Water Quality Control Plan, as adopted on December 9, 1993, Section 3-2.00

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# The State's Storm Water Program Administration

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## Regulatory Structure Has Three Levels: Federal, State, and Regional

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### For States that Administer the Program, USEPA Has Oversight Role

When the USEPA allows a state to administer the NPDES permit program, the federal role is limited to oversight. In that role, the USEPA reviews water quality standards, basin plans, and NPDES permits. Procedurally, the USEPA comments on permits within a negotiated timeframe with the State but does not pre-approve each permit. The USEPA also conducts program and financial audits and, at its discretion, can revoke its delegation of the program. The state, instead of USEPA, issues individual and general permits for storm water discharges. The USEPA can veto permits.

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### State Board Sets Policy, Coordinates, and Oversees Program

California has a long history of regulating water issues. The predecessors to the State Water Resources Control Board were a State Water Rights Board and State Water Quality Control Board. The State Water Rights Board was created in the early 1900s to arbitrate and resolve the state's water battles, which began during the 1849 Gold Rush. The State Water Quality Control Board was established in the late 1940's to streamline the regulatory process for addressing water quality problems. In 1967, the State Water Rights Board and the State Water Quality Control Board were merged to create the State Water Resources Control Board (State Board), integrating water rights and water quality decision-making authority.

The State Board is organized into four divisions that address water quality, water rights, financial assistance, and administrative functions. The Storm Water Section of the Division of Water Quality administers the storm water program. In addition, for water quality standards adoption, the Basin Planning Unit of the State Board's Division of Water Quality

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coordinates planning efforts among the nine Regional Water Quality Control Boards (regional boards) as well as with the Office of Administrative Law and the USEPA. To accomplish its mission, the State Board works closely with the regional boards. (The duties and role of the regional boards are discussed below in the next section.)

Rather than have the State and federal government operate separate water pollution control programs in California, the State Board has integrated the two by accepting the administrative responsibility for the federal program, as allowed under the Clean Water Act. The Board has created joint State and federal processes for activities such as setting water quality standards, issuing discharge permits, and operating the grants program.

The State Board (or, in most cases, the regional boards) issues one discharge permit for purposes of both programs<sup>8</sup>, sets statewide policy, and coordinates and supports the regional boards' effort. The State Board also reviews petitions contesting regional boards' actions or failures to act. To hear a petition, the State Board must have received it within 30 days of the regional board's action or within 60 days after the petitioner has made an unsuccessful request to the regional board to take a specific action.<sup>9</sup> In addition, the State Board conducts public hearings to adopt or modify the regional plans. The State Board has broad authority to hold any hearings and conduct investigations necessary to carry out its vested powers.<sup>10</sup>

The State Board has issued three major statewide, general storm water permits that cover classes of dischargers: industrial, construction, and municipal (see Storm Water Permits Section below). A regional board can issue individual and general permits for discharges within its jurisdictional area. The statewide general permits are essentially "generic" permits under which individual applicants apply for coverage. The Board issued statewide permits for industrial and construction sites because it would be impracticable to issue individual permits to the tens of thousands dischargers. Although the State Board covers dischargers under the statewide, general permits, the regional boards implement and enforce the provisions of all permits, while the State Board coordinates the implementation.

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### Regional Boards Regulate Program

Created by the Dickey Water Pollution Act, the regional boards have been responsible for protecting the surface, ground, and coastal waters of their regions since 1949. Each of the nine regional boards has nine part-time board members appointed by the Governor. Regional boundaries are based on watersheds, and a Caltrans district can fall under the jurisdiction of more than one regional board. (*See Exhibit 1*)

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<sup>8</sup> Under State law, the permit is termed a "waste discharge requirement." And under federal law, a NPDES permit.

<sup>9</sup> California Water Code Section 13320(a)

<sup>10</sup> California Water Code Section 183



The regional boards assume the major role in regulating storm water discharges by developing water quality control plans, issuing and enforcing permits including individual and region specific general storm water permits, and enforcing the provisions of the statewide, general permits. Article 3 of Chapter 4 of the Porter-Cologne Act directs the regional boards to adopt, review, and revise water basin plans, and provides specific guidance on factors that must be considered in setting water quality objectives and implementation measures. Through its water quality control plan or “basin plan,” a regional board makes water quality decisions for its region, describing what constitutes reasonable protection of beneficial uses and prevention of nuisance for the various water bodies and water sheds within its regions. The basin plan includes beneficial uses, water quality objectives, and implementation programs. It also sets standards, waste discharge requirements, and identifies compliance thresholds and enforcement actions for violations. A permit is the instrument used to implement a basin plan.

The adoption or revision of basin plans requires public participation.<sup>11</sup> If the public's suggestions are not incorporated into the plans or revision, then the regional board must demonstrate that those viewpoints have been considered. Once the regional board has adopted the plan, it is forwarded to the State Board for review and approval. Approval by the USEPA and the Office of Administrative Law is also required.

The regional boards also issue and enforce the individual area-wide municipal separate sewer system permits (as described below), and any facility-specific industrial or construction storm water permits for facilities that it determines should be regulated individually rather than under a general permit. In addition, the regional boards enforce the provisions of the statewide, general storm water permits for dischargers covered under that permit (see Storm Water Permits Section below for more information). The regional boards conduct all regulatory activities required to implement and enforce the permits, including, but not limited to compliance inspections, reviewing annual reports, and storm water management plans submitted by dischargers.

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### Storm Water Permits

As noted earlier, there are three major general storm water permits issued by the State Board in California under the provisions of the NPDES program: construction discharges, industrial discharges, and small municipal discharges. The State Board has also issued a construction permit to utilities.<sup>12</sup> The regional boards issue other storm water permits including area-wide<sup>13</sup> municipal separate storm sewer system permits.

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<sup>11</sup> California Code of Regulations Title 23, Division 2, Chapter 1.5, Sections 649 et. Seq.

<sup>12</sup> Finance does not discuss this permit.

<sup>13</sup> Area-wide generally refers to permits issued to a group of co-permittees encompassing an entire metropolitan area.

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- **The General permits for storm water discharges associated with industrial activities** (industrial permit) covers most federally-owned, state-owned, municipally-owned, and privately-owned industrial facilities including, but not limited to, fertilizer manufacturing, specific manufacturing facilities, mining, hazardous waste treatment, landfills, recycling facilities, specific transportation facilities, sewage, and wastewater treatment works.
  - **The general permit for storm water discharges associated with construction activities** (construction permit) covers construction activities that results in soil disturbance over one acre,” but does not include disturbances to maintain original line and grade, hydraulic capacity, or the original purpose of the facility; or emergency construction activities required to protect public health and safety.”<sup>14</sup>
  - **The general permit for the discharge of storm water from small municipal separate storm sewer systems covers small municipalities** (serving less than 100,000 people), including non-traditional small municipal separate storm sewer systems such as governmental facilities (military bases, public campuses, and prison and hospital complexes).
  - **Area-wide municipal separate storm sewer system permits** (serving more than 100,000 people) covers “...waste flows from urban development and activities (including residences, streets, and commercial establishments and road systems owned by states).”<sup>15</sup>

Caltrans’ statewide permit does not fall into any of these categories as it is a hybrid of two categories. It is a statewide permit that incorporates both construction and municipal separate storm sewer system requirements into one permit (see Caltrans’ Permit for additional information).

To apply for coverage under a general permit, an individual discharger must submit a notice of intent to comply with the permit (Notice of Intent) and a fee for each facility, construction site, or small municipal separate storm sewer system. Once the Notice of Intent has been approved by the State Board (or by the regional board in the case of the Small Municipal Separate Storm Sewer System permit), the applicant’s project is automatically covered under the provisions of the general permit.

NPDES storm water permits place both general and specific requirements on the permittee. An example of a general requirement would be that storm water discharges to any surface or ground water shall not adversely affect human health. A specific requirement would be

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<sup>14</sup> State Water Board, Fact Sheet for NPDES General Permit for Storm Water Discharges Associated with Construction Activity, p.2 (August 20, 1992).

<sup>15</sup> California Environmental Law and Land Use Practice, p.33-169.

to conduct street sweeping at least once a month. Typically, storm water permits place narrative, not numeric limitations on the permittee.

Each type of permit has two different performance standards (technology based and water quality based) that are specified in federal law and are the benchmarks used to measure the success of the various pollution control approaches that have been implemented. Typically, these permits do not include specific, numeric effluent limitations, instead specifying best management practices as an acceptable means of complying with the performance standards.

Industrial and construction permits require reduction of pollutants using *best available technology (BAT)* and *best conventional technology (BCT)*. These are commonly referred to as “technology-based” standards, which means that they are based on the performance of treatment and control technologies rather than on risk or impacts upon receiving waters.<sup>16</sup> In addition to technology-based performance standards, industrial and construction storm water permits also require strict compliance with water quality standards.

The technology-based performance standard for municipal permits is the reduction of pollutants to the “maximum extent practicable.” In addition to the technology-based standard and in contrast to industrial and construction storm water permits, municipal permits allow compliance with water quality standards through an iterative approach. The State and regional boards have the discretion to determine whether to require strict compliance with water quality standards for municipal permits.

The “maximum extent practicable” standard is not defined by the Clean Water Act or the implementing regulations. According to the USEPA, it is intended to be flexible to allow the development of site-specific permit conditions based on the best professional judgment of the permit writer.<sup>17</sup> This flexibility has led to conflicting opinions on how to achieve the standard.

The State Board has instead implemented a more practical definition of the maximum extent practicable standard that uses the concept of best management practices. “Best management practices” are defined as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States.<sup>18</sup> The term refers to the most effective, feasible

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<sup>16</sup> <http://www.epa.gov/OST/guide/>

<sup>17</sup> STORM WATER PHASE I MS4 PERMITTING: WRITING MORE EFFECTIVE, MEASURABLE PERMITS, USEPA, Region IX; <http://www.epa.gov/ORD/NRMRL/Pubs/625R03003/13Gentile.pdf>

<sup>18</sup> 40 Code of Federal Regulations § 122.2.



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method that does the job of controlling pollutants. In the context of storm water management, best management practices can be:

- Structures-or other devices used to manage or treat the water. Examples include a catch basin insert, detention basin, or a filter system.
- Source control measures addressing a behavioral practice, such as timely cleaning of catch basins, or habitual closing of the lid on a dumpster.
- Source control measures addressing a behavioral restraint or change, such as minimizing the use of lawn fertilizer, or use of road salt or sand, or educating the public on the sources of storm water pollution.

The State Board describes the maximum extent practicable standard as follows:

*“There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of best management practices, a permittee chooses only a few of the least expensive methods, it is likely that maximum extent practicable has not been met. On the other hand, if a permittee employs all applicable best management practices except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard.”<sup>19</sup>*

While cost is a factor, the burden of proof is entirely on the permittee; regional boards are not required to perform a cost-benefit analysis, but must describe its rationale in determining whether the maximum extent practicable standard has been achieved. Thus, a regional board can continue to require a permittee to implement additional best management practices until the board is satisfied that the maximum extent practicable standard has been achieved. There has been litigation on this issue, which to date has been unsuccessful. The litigants claimed that the regional boards’ latitude in determining when the standard has been met nullifies cost considerations.

This litigation is discussed in more detail in the Consent Decrees and Court Directives Affect Program Administration section of this report (See page 31). In addition to the performance standards that are applied to each category of permit as discussed above, there are specific requirements for the industrial, construction, and municipal separate storm sewer system permits.

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<sup>19</sup> State Board Order WQ 2000-11, page 20.

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### **Storm Water Permit Requirements for Industrial and Construction Dischargers**

There are two specific planning requirements for general industrial and construction activity permits for storm water discharges: a pollution prevention plan, and a monitoring plan for each facility/construction site. The pollution prevention plan includes a range of activities and practices to reduce pollutants and must be developed and implemented before operations begin. (See Appendix C for the elements required in a pollution prevention plan). The monitoring plan lists inspections to identify areas contributing to storm water discharges before and after storm events. In addition, the monitoring program evaluates the adequacy and implementation of the control practices identified in the pollution prevention plan.

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### **Permit Requirements for Municipal Separate Storm Sewer Systems**

In contrast with industrial and construction permits that require a pollution prevention plan, the municipal separate storm sewer system permit requires a storm water management plan and in some cases—but not always—a monitoring plan. The management plan describes how the permittee will achieve the goal of reducing the discharging of pollutants to the maximum extent practicable. Elements of the plan include a description of the best management practices that will be implemented to address specific program areas, measurable goals, and timetables for the implementation of various management control programs that include :

- **Public education and outreach**—educating the public in its jurisdiction about the importance of the storm water pollution control program;
- **Public participation and involvement**—a requirement that the permittee must comply with all State and local notice requirements;
- **Illegal discharge detection and elimination**—adoption and enforcement of ordinances that detect and prohibit illicit discharges;
- **Construction runoff control**—development of a program to control the discharge of pollutants from construction sites;

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- **Post-construction runoff control**—a requirement that the permittee implement post-construction best management practices that protect water quality and control runoff flow; and
  - **Pollution prevention measures**—development of a program to prevent the discharge of pollutants.
  - **Industrial runoff control**—applicable to Phase I storm water programs and requires the development of a program to control discharge of pollutants from industrial sites or activities.

To apply for coverage under the permit, an entity must submit an application (for Phase II municipalities an application form is a Notice of Intent) and a storm water management plan. Once adopted, the management plan is included by reference as an integral and enforceable component of the permit. The permittee must report annually on its progress in implementing the management plan.

A monitoring plan is generally required only for medium and large municipalities. The monitoring plan requires that the permittee evaluate the effectiveness and adequacy of its storm water management program (similar to the general permits for industrial and construction activities).

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## **Approval of Permits and Plans**

A NPDES permit is issued in a quasi-adjudicative proceeding, which is an administrative hearing to receive evidence for determination of facts used to formulate and issue a decision that determines a legal right, duty, privilege, immunity, or other legal interest of a particular person or persons. Examples of State Board or regional board quasi-adjudicative proceedings include hearings to receive evidence concerning the issuance of waste discharge requirements; decisions or orders on water right applications, petitions or complaints concerning cease and desist orders; and orders setting administrative civil liability.

The State Board issues regulations that govern adjudicative proceedings both for itself and the nine regional boards, as authorized by the Administrative Procedure Act of the Government Code.<sup>20</sup> These code sections describe a process that is similar to a court proceeding in terms of time frames and protocol. For example, witnesses must be sworn-in, allowed to be cross-examined, and a record of the proceedings must be kept.

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<sup>20</sup> Chapter 4.5, commencing with Section 11400

On the other hand, rulemaking and informational proceedings are not quasi-adjudicative proceedings and are therefore subject to different procedures. Such proceedings include hearings for the adoption or amendment of regulations, water quality control plans or policies, and hearings to gather information to assist the State Board and regional boards in formulating policy for future action.<sup>21</sup>

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### **Additional Approvals Required**

Obtaining approval for a specific project can be complicated by the necessity of obtaining more than just a NPDES permit. After a NPDES permit is secured, additional approvals from other state agencies or the Army Corps of Engineers may still be required before work commences on a project. For example, the Department of Fish and Game may regulate aspects of the project through the requirement for a streambed alteration agreement. Streambed alteration agreements are necessary when a project's activities might affect intermittent and perennial streams, rivers, or lakes. A permit from the Coastal Commission may be required if a coastal zone might be impacted by the placement of any solid material or structure; a change in land use density or intensity (including any land division) or a change in the intensity of water use or access to water or removal of major vegetation. Thus, the approval process for a project may need to come from many different sources all of which have their own requirements of the permittee.

It is possible for a permittee to receive approval for plans by a regional board and be blocked by other entities. For example, in Caltrans District 12, storm water runoff from a state highway discharges directly into Crystal Cove, which is an area classified as "of special biological significance."<sup>22</sup> The Santa Ana Regional Board issued a cease-and-desist order in November 2000 prohibiting the discharge of runoff directly into the area.<sup>23</sup> To comply with the order, Caltrans proposed a plan, estimated to cost at least \$3 million, to divert storm water runoff into a bioswale where it would be filtered before being discharged into Los Trancos and Muddy Creeks. The regional board accepted the plan in September 2002, but the bioswale has not yet been constructed, because an environmental advocacy group filed an appeal with the Coastal Commission in April 2003 to prohibit the discharge into those creeks.<sup>24</sup> Caltrans believes that the resolution may require it to implement even more runoff monitoring and treatment beyond what the regional board has required.

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<sup>21</sup> California Code Regulations, Title 23, § 649 et. Seq.

<sup>22</sup> According to its website, the State Board defines an area of special biological significance as "requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable."

<sup>23</sup> There are 40 areas of special biological significance within Caltrans' districts.

<sup>24</sup> The Trancos Creek was listed as impaired on the 303d list in March 2003.

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## **Variety of Enforcement Tools Available to Address Noncompliance**

The State Board and regional boards use a variety of administrative and judicial enforcement tools when dischargers do not comply with permit requirements. In almost all cases enforcement actions are initiated by the regional boards. The enforcement actions are initiated at the discretion of each regional board, with resulting differences in the level of enforcement from region to region. The State Board has attempted to address this by issuing a water quality enforcement policy with the primary goal “to create a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits.”<sup>25</sup>

The policy establishes two levels of enforcement actions: informal and formal. The former is any enforcement action taken by the State Board or regional board staff that is not defined in statute and can include any form of communication between staff and a discharger about a violation or potential violation. On the other hand, formal enforcement actions are statutorily recognized actions to address a violation or threatened violation of water quality laws, regulations, policy, or orders. Formal enforcement orders contain findings of facts that establish all the statutory requirements of the specific statutory provision being utilized. Table 1 (page 26) summarizes the categories of formal enforcement actions.

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<sup>25</sup> State Water Resources Control Board Resolution No. 2002-0040, Water Quality Enforcement Policy, February 15, 2002.

TABLE 1

## Formal Enforcement Actions

**Notice to Comply**—Citation for minor violations.

**Notice of Storm Water Noncompliance**—The means by which each regional board notifies storm water dischargers who have failed to file a notice of intent to obtain coverage, a notice of non-applicability, a construction certification, or annual reports.

**Technical Reports and Investigations**—Each regional board has the authority to conduct investigations and to require technical or monitoring reports from any person who has discharged, discharges, or is suspected of having discharged or discharging.

**Cleanup and Abatement Orders**—An order issued to any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by the State Board or a regional board.

**Section 13300 Time Schedule Orders**—The regional board can require the discharger to submit a time schedule which sets forth the actions that the discharger will take to address actual or threatened discharges of waste in violation of requirements.

**Section 13308 Time Schedule Orders**—The regional board can issue a Section 13308 Time Schedule Order, which prescribes a civil penalty if compliance is not achieved in accordance with the time schedule.

**Cease and Desist Orders**—Orders issued to dischargers violating or threatening to violate waste discharge requirements or prohibitions prescribed by the regional board or the State Board. This type of order is often issued to dischargers with chronic noncompliance problems.

**Modification or Rescission of Waste Discharge Requirements**— Each regional board may modify or rescind waste discharge requirements in response to violations. Depending on the circumstances of the case, rescission of waste discharge requirements may be appropriate for failure to pay fees, penalties, or liabilities.

**Administrative Civil Liability**—Monetary assessments imposed by a regional board or the State Board.

**Referrals to Attorney General, District Attorney, United States (U.S.) Attorney, or City Attorney**—The regional board or State Board can refer violations to the State Attorney General for civil enforcement actions. The regional board or State Board can also request the appropriate county district attorney or city attorney to seek criminal prosecution. In some cases (e.g., when the District Attorney or Attorney General is unable or unwilling to accept a case), the regional board may find it appropriate to request the USEPA's criminal investigation division or the U.S. Attorney's Office to review potential violations of federal environmental statutes, including but not limited to the CWA, the Endangered Species Act, the Migratory Bird Treaty Act, or the Resource Conservation and Recovery Act.

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# Caltrans' Storm Water Management Program Administration

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## Caltrans' Program Structure

Caltrans has a headquarters and 12 districts, with each district headed by a district director. Each district operates programs or functions that receive day-to-day supervision from the district director pursuant to program direction provided by Caltrans' headquarters staff in Sacramento. Caltrans terms this a "matrix organization" in which each district has the latitude to meet the requirements of the region as long as it adheres to the overall policy limitations and directives established by the Directorate of the department.

Caltrans manages the Storm Water Management Program using this matrix model. Headquarters' develops policy and oversees, monitors, and reports on departmental activities while district personnel have day-to-day responsibility for implementing the Program.

At headquarters, the staff from the Division of Environmental Analysis manages the Program and coordinates program implementation with the districts and other headquarters' programs.

Each district has a Storm Water Coordinator, with organizational placement of the position at the district director's discretion. Rather than having line authority, the coordinator facilitates program implementation with Headquarters and the different district functional areas (i.e., Construction, Maintenance, Design, Environmental, Right-of-Way, and Operations). Facilitation activities typically include meeting with functional area managers to ensure the appropriate interpretation of storm water policy directives and answering questions relative to specific requirements and how they do or do not comply with the statewide permit. In addition to working with departmental staff, the coordinator also serves as the liaison to the various regional boards.

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### **Caltrans' Permit Requirements**

From 1990 to 1999, each Caltrans district was subject to individual municipal permits issued by the various regional boards, often as part of a permit to the municipalities in the region, and to the statewide construction permit. This involved preparing a separate storm water management plan for each of its regional boards. Recognizing that individual area-wide permits can vary significantly in compliance requirements, and seeking some degree of uniformity in the application of the State Board's directives, Caltrans applied for a single statewide storm water permit in 1996 and coverage under the statewide construction permit. Consistent with municipal separate sewer system permit requirements, Caltrans also had to submit statewide management and monitoring plans as part of the application for permit.

In July 1999, the State Board issued Caltrans a single statewide permit that covers both the municipal separate storm sewer system requirements and the Construction General Permit requirements. The permit contains an array of limitations, directives, reporting requirements, and thresholds that Caltrans must meet in reducing storm water pollution. Although Caltrans now operates under this statewide permit, it still must meet the requirements and different performance standards of each of the two applicable categories (construction and municipal separate storm sewer system). Moreover, Caltrans remains subject to the beneficial uses, water quality objectives, prohibitions, and implementation programs contained in each of the nine regional boards' basin plans, even though Caltrans' original intent in seeking the statewide permit was to avoid the regulatory differences that were inherent in each of the regional boards' basin plans. Thus, even under a statewide permit, Caltrans deals primarily with the regional boards and with a permit management process that is driven more from the bottom up than the top down. This approach is consistent with a regionally based program of water quality management, but is difficult for the management of a centrally directed state highway system; particularly when trying to anticipate and manage program directions and costs.

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### **Caltrans' Storm Water Management Plan**

Caltrans' statewide NPDES permit directs it to implement its storm water management plan, which is an integral and enforceable component of the permit and must be updated annually. Caltrans submitted its initial plan to the State Board in August 2000, received final approval in May 2001 subject to conditions established by the State Board that were to be addressed by August 2001. Caltrans published the final plan in August 2001. Caltrans



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submitted a revised storm water management plan, as required by its permit, with its annual report in April 2002. The management plan received approval in February 2003, but with five unresolved issues. According to Caltrans' staff, one of the five issues remains unresolved. The time lags between submittal and approval reflect the protracted negotiations between the permittee and regulator on plan elements. Caltrans is required to submit its annual revised storm water management plan in January 2004, as part of the permit renewal process.

Caltrans' storm water management plan describes its facilities, organizational responsibilities, legal authorities, funding, training, public education activities, the annual reporting program evaluation process, and required monitoring studies. The plan also describes in summary the best management practices available for implementation. For example, the plan identifies the best management practices available to be used to control soil erosion during construction. Detailed information regarding best management practices are provided in an attachment to the management plan. (A more detailed description of the Caltrans' plan and the recommended best management practices can be found in Appendix D).

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### **Caltrans' Monitoring Plan**

Caltrans must evaluate the effectiveness and adequacy of its Storm Water Management Program annually. This includes both monitoring and a self-audit of the program. Caltrans has submitted a general monitoring plan with its three-year monitoring strategy. Caltrans must also submit a detailed monitoring program each year before the upcoming rainy season. According to its permit, monitoring is intended to demonstrate the effectiveness of Caltrans' storm water compliance through the following activities:

- Characterization of storm water discharges, including pollutant concentrations and mass loadings, from locations representative of Caltrans owned properties, facilities, and activities. Of particular interest is the discharge of high volume systems, which discharge to areas subject to or sensitive to beach closures.
- Evaluation of effectiveness of maintenance activity control measures.
- Evaluation of effectiveness of maintenance facility pollution prevention plans.
- Evaluation of effectiveness of construction erosion prevention and control measures.
- Evaluation of effectiveness of permanent control measures.
- Evaluation of effectiveness of highway operation control measures.

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# Evaluation of Caltrans' Storm Water Management Program Administration

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## Consent Decrees and Court Directives Affect Program Administration

Courts have found that Caltrans did not fully comply with its various permits as a result of citizen suits that have been filed against the department. These suits, which are allowable under provisions of the Clean Water Act, are the mechanism used by the public to address issues of potential noncompliance with the Clean Water Act, and have resulted in court directives and rulings imposing specific activities on Caltrans. According to David Beckman, an environmental attorney of the Natural Resources Defense Council (NRDC), "The citizen-suit provision of the Clean Water Act has helped spur a tremendous amount of citizen activism and empowerment. It's a profoundly democratic creation to allow people affected by pollution to seek redress in court." Under this provision, the NRDC and the various "water keepers"<sup>26</sup> have had a major influence on the administration of clean water programs.<sup>27</sup>

In October 1993, the first of several lawsuits was filed against Caltrans in federal court alleging violations of the Clean Water Act. The NRDC alleged that the Caltrans director and the Los Angeles Caltrans office had failed since 1991 to comply with the Clean Water Act. After hearing testimony, reviewing findings of fact, and conclusions of law, the judge issued an injunction on December 14, 1994, permanently enjoining Caltrans from discharging storm water from Caltrans facilities and operations in violation of the Separate Storm Sewer System Municipal permit that was in effect or any successor permit.

The court order required Caltrans to develop and implement a comprehensive storm water management plan for the Caltrans district covered by the Municipal permit (District 7—Los Angeles). One of the most significant requirements was that the plan evaluate the

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<sup>26</sup> A keeper is a nonprofit, citizen-based, water patrol organization whose special responsibility is to be the public advocate for a water body. California Coast Keeper Website: [www.cacoastkeeper.org/cacoast/what-is-a-keeper.html](http://www.cacoastkeeper.org/cacoast/what-is-a-keeper.html).

<sup>27</sup> The number of citizen's suits has prompted some to question the reasoning for the proliferation of these actions. Some are concerned that "law firms are using the Citizen Suit provisions as a means to obtain monetary settlements with dischargers." The rationale for this perspective is that the citizen's suit provision allows the aggrieved person to recover all costs of litigation including the costs associated with expert witnesses.

## A Review of the Department of Transportation's Storm Water Management Program

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effectiveness of best management practices including their technical and fiscal feasibility. This requirement provided a platform for citizens groups to challenge Caltrans' findings on effectiveness, and even today continues to be the source of various motions by the NRDC alleging continued violations of the original order.

Table 2 lists the original complaint from October 1993 and the various motions filed by the NRDC alleging subsequent violations.

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**TABLE 2**

### **Motions Filed by the NRDC**

<b>October 1993</b>	The Natural Resources Defense Council sues the Caltrans director and the Los Angeles Caltrans District office, arguing that the agency has failed since 1991 to comply with the Clean Water Act.
<b>December 1994</b>	A federal judge rules in favor of the plaintiff, saying Caltrans consistently failed to comply with the Clean Water Act at construction sites and highways in Los Angeles and Ventura counties.
<b>September 1995</b>	The federal court overseeing the Los Angeles case finds that Caltrans failed to comply with the permanent injunction requiring monitoring programs and annual storm-drain cleaning.
<b>March 1996</b>	A Los Angeles federal court orders Caltrans to show it is in compliance with drain cleaning and monitoring requirements, calling the agency's effort "wholly inadequate." Under the threat of contempt, the department begins cleaning about 30,000 freeway drains.
<b>March 1997</b>	A Los Angeles federal court orders Caltrans to monitor effectiveness of storm-water control methods. The court also extends its supervision of the case.
<b>May 2002</b>	Natural Resources Defense Council files a complaint alleging that Caltrans has campaigned against storm-water controls in violation of a 1998 court order to study those methods without bias.

Source: Los Angeles Times

Another consent decree is the result of a case filed in federal court by the NRDC and the San Diego Bay Keepers in 1996 against Caltrans alleging that Caltrans was violating the provisions of the Clean Water Act. In December 1997, a consent decree was approved which required Caltrans to "immediately and completely comply" with numerous provisions associated with specified implementation and maintenance plans for controlling storm water discharges. Although these provisions directed actions that were consistent with the

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plans Caltrans already had started to implement, one provision is still outstanding that has the potential to generate additional motions or legal challenges. This provision requires Caltrans to submit for approval to the NRDC a plan for a retrofit pilot program that is designed to determine the appropriateness of retrofitting at Caltrans' existing facilities and rights-of-way. Appropriateness is to be determined by considering the hydraulic proximity to sensitive waters, potential for improvements in water quality, including without limitation water quantity effects, technical feasibility, integration with other scheduled activities, and cost reasonableness.

The pilot program is significant because it has the potential to become the standard by which Caltrans must address retrofitting efforts throughout the entire system. The study must document the effectiveness of the various best management practices in removing selected constituents from storm water highway runoff. Of particular interest will be the assessment of the cost reasonableness. To accurately evaluate costs, Caltrans has been keeping detailed records on the design, construction, operation, and maintenance of each of the retrofit devices. As of September 1, 2003, however, the results of this required pilot study had not been finalized. According to Caltrans staff, the delay is due to the requirement (per the permanent injunction) that the final report be developed cooperatively with the NRDC. The two parties are trying to reach agreement on the conclusions that can be drawn from the pilot studies. The NRDC can petition the court to stop the issuance of the final report if they are not satisfied that the conclusions are the result of the cooperative process.

Another court ruling that many storm water administrators believe will have a major effect on the administration of the NPDES permit requirements is a ruling from the U.S. Court of Appeals, Ninth Circuit, in the case of *Defenders of Wildlife and the Sierra Club v. Carol M. Browner*. (The Ninth Circuit Appeals Court has jurisdiction over the western region that includes California.) Storm water program administrators, including Caltrans, are concerned about this ruling's effect on the storm water provisions of the Clean Water Act, and how the costs for compliance are factored into the implementation decisions. Administrators are concerned with the possible outcome that there is no threshold beyond which it would not be feasible to incur compliance costs.

The crux of the economic issue is the latitude the court ruling gives permitting agencies to set requirements that are not dictated by fiscal considerations. The Browner case held that the Clean Water Act leaves it to the permitting agency to determine whether to require municipal storm-sewer discharges to strictly comply with state water quality standards in a NPDES permit. At a minimum, the Clean Water Act requires the reduction of discharge

of pollutants to the maximum extent practicable. If achievement of water quality standards were required by the permitting agency, the maximum extent practicable standard might not be the ceiling for required storm water controls. Therefore, the NPDES permit could theoretically require costs to comply that were prohibitive.

The appellate court ruling determined that permitting agencies can impose the more stringent requirement, which is the requirement to achieve the applicable “water quality standards.” The court also stated that the permitting agency could also require something less than strict compliance with water quality standards. The significance of the court’s ruling is that the Boards are authorized to require the achievement of water quality standards, and *do not* have to take into consideration the economic factors associated with achieving the water quality standard. This ruling applies to storm water runoff regulated by municipal separate storm sewer NPDES permits, such as Caltrans. For all other permits, compliance with water quality standards is required, and may not be waived by the permitting agency.

The State Board has exercised the latitude allowed by the court ruling by adopting Order WQ 2001-15 that requires permittees to adhere to water quality standards through an iterative process in municipal separate storm sewer system permits, but not requiring strict compliance with those standards. Thus, California’s requirements for municipal separate storm sewer system permits are more rigorous than required under federal law, but consistent with the court order.

At a national level, the cost implications of the court order remain unclear. Some permittees believe that without the “practicable” provision, municipalities could literally “go broke” trying to comply with the requirements of their NPDES permit. The following quote from a storm water trade journal poses clearly the question on whether cost factors have the same weight in fact that they appear to have in federal law: “The fact that cost should and can be considered when developing a maximum extent practicable program is incontrovertible — to what extent is a source of controversy and must be balanced with other considerations.”<sup>28</sup> The State Board advises that other types of dischargers also claimed that compliance with water quality standards would be cost prohibitive, but that these claims have not been borne out with time.

The State Board believes it has addressed concerns about costs, pointing out that its permit states that compliance is to be achieved over time, through an “iterative process” requiring improved best management practices. The iterative process requires permittees to design their management plans to achieve compliance with water quality standards. The regional

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<sup>28</sup> Andy Reese, Storm Water: The Journal for Surface Water Quality Professionals, March/April 2003

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board determines when, and if a best management practice is achieving the standard. If a discharge is causing or contributing to an exceedance of the standard, then the regional board can require the management plan to be updated or revised. The State Board feels that this iterative process gives it the regulatory flexibility to address achievement of water quality standards in an incremental and practical manner.

The Department of Finance's staff counsel reviewed Order WQ 2001-15 and the Browner case. The staff counsel's analysis indicated that the State Board sets compliance with water quality standards as the goal, but confirms that the State Board has adopted a standard of less than strict compliance that "seeks compliance over time" through an iterative approach. According to the staff counsel, "The precise definition of an iterative approach and the factors to be considered and measured over time are not clearly set forth, though there is no language in the Order that would confirm that costs of compliance or best management practices/maximum extent practicable were rejected as no longer relevant considerations by the State Board. The definition of maximum extent practicable and how it is applied would appear to be something that will evolve over time in the iterative process toward meeting water quality standards. Nothing precludes the State Board, however, from later exercising its discretion in a subsequent order to require strict compliance with water quality standards. That too would be consistent with Browner, and might reflect the State Board's view of the success, or lack thereof, over time of the iterative approach toward meeting water quality standards."

The Building Industry Association of San Diego County believed that the State Board's Order WQ 2001-15 exceeded the federal law and therefore recently challenged the Order in Superior Court of San Diego County (February 2003). The Building Industry Association argued in court that the strict requirements of Order WQ 2001-15 conflict with the standard in federal law (i.e., maximum extent practicable) and that the requirements could dramatically increase the cost of new housing and may not result in cleaner water. The judge ruled in April 2003 that the State Board was within its authority to impose more stringent permit requirements to curb storm water run-off. The Building Industry Association has filed a notice of appeal to the Court of Appeal.

As can be seen by the resulting court interventions and rulings, the administration of the Caltrans' Storm Water Management Program has become more complex and in some cases subject to court supervision. Given the success that citizens' groups have experienced in using court orders and consent decrees to shape the administration of the Storm Water Management Program, it is likely that litigation will continue.

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# Program Administration Issues

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## **Relatively Few Enforcement Actions Issued by the Regional Boards, but They are Not Well Tracked by Caltrans**

The regional boards have the ability to take a variety of enforcement actions both formal and informal to ensure program compliance. The number of enforcement actions issued by the regional boards can be an indication of program administration problems or an indication of how well the program is operating. Caltrans and the State Board, which has a centralized database, provided the number and types of enforcement actions that have been taken by the regional boards against Caltrans from July 1, 2001 to March 21, 2003. Caltrans reported 24 enforcement actions were issued to the department while the State Board reported 46 for the same period (see Tables 3 and 4 below).

Caltrans does not have a central repository for this information, and therefore the information was not readily available. Program officials were not familiar with the number of enforcement actions that had been issued. Caltrans' headquarters officials asked district officials to supply the information. (Appendix E lists the detailed information provided by Caltrans on each enforcement action.) According to Caltrans headquarters' officials, the department now has a procedure in place to accurately track the number of enforcement actions issued by the various regional boards.

Of the 24 enforcement actions Caltrans provided to Finance, nine were administrative civil liability complaints, which are formal enforcement actions. The remaining 15 were informal enforcement actions. Of the 24 actions, 14 were within the Lahontan Regional Water Quality Control Board area and seven within the San Diego Regional Water Quality Control Board. (It should be noted that 12 of the 14 citations issued by the Lahontan Regional Water Quality Control Board were associated with one project, the Boca/Floriston Project.)

## A Review of the Department of Transportation's Storm Water Management Program

**TABLE 3**

### Enforcement Actions Issued to Caltrans July 1, 2001 to March 21, 2003

Caltrans District	RWQCB	Number of Notices	Number of Projects Cited for Violations	Description of Violations
3	Lahontan	14 <sup>29</sup>	3	Discharge of sediment laden water, malfunction of BMP, failure to properly winterize, unauthorized soil disturbance, lack of proper preclusion methods for deterring public contact with waste water facilities, discharge of construction debris into 100 year floodplain
5	Central Coast	1	1	Inappropriate or lack of deployment of BMPs
7	Los Angeles	1	1	Discharge of sawcut waste
11	San Diego	7 <sup>30</sup>	5	Discharge of blast material and paint into San Diego Bay, dripping sink, stockpiles not properly protected, improper painting operations, erosion control problems, failure to implement BMPs
12	Santa ana	1	1	Discharge into channel, Storm Water Pollution Prevention Plan lacked BMP implementation
<b>Total</b>		<b>24</b>	<b>11</b>	

Of the 46<sup>31</sup> enforcement actions the State Board provided to Finance, one was an administrative civil liability order, six were administrative civil liability complaints, and six were notices to comply, which are formal enforcement actions. The remaining 33 were informal enforcement actions. Of the 46 actions, 17 were within the Lahontan Regional Water Quality Control Board area and 20 within the San Diego Regional Water Quality Control Board. (It should be noted that 15 of the 17 citations issued by the Lahontan Regional Water Quality Control Board were associated with one project, the Boca/Floriston Project while nine of the 20 citations issued by the San Diego Regional Water Control Board were issued for the I-5/805 widening project.)

<sup>29</sup> 12 enforcement actions were issued for the Boca/Floriston project with three issued on 11/28/01 and three issued on 1/29/03. Two additional enforcement actions were issued as follow-ups.

<sup>30</sup> 3 Notice of Violations were issued for the I-5/805 widening project.

<sup>31</sup> Finance did not include 13267 Letters in the table because these letters, although formal enforcement actions, can be requests for technical information may not be issued for actionable issues.

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**TABLE 4**

**Enforcement Actions Issued to Caltrans  
As Reported by the State Board  
July 1, 2001 to March 21, 2003**

	Type of Action, by number					
	Formal Enforcement Actions			Informal Enforcement Actions		Total
Regional Board	Administrative Civil Liability Order	Administrative Civil Liability Complaint	Notice to Comply	Notice of Violation	Staff Enforcement Letter	
San Francisco Bay			3			3
Central Coast					1	1
Los Angeles				4		4
Lahontan	1	6	1	3	6	17
Santa Ana				1		1
San Diego			2	8	10	20
<b>Total</b>	<b>1</b>	<b>6</b>	<b>6</b>	<b>16</b>	<b>17</b>	<b>46</b>

As can be seen from Tables 3 and 4 above, Caltrans and the State Board do not agree about the number of formal or informal enforcement actions taken against Caltrans. Finance did not reconcile the differences in the number and type of actions in the tables. Caltrans program officials should be well informed about the number of actions issued against the department, and those actions should coincide with the State Board's records.

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### **USEPA Review Found Only Minor Deficiencies**

The USEPA Region 9 commissioned a program evaluation of Caltrans District 5 (Central Coast) Storm Water Management Program to determine the level of compliance with the provisions of the NPDES permit and the storm water management plan. The evaluation, which was conducted at the request of the Central Coast Regional Water Quality Control Board and was issued in November 2002, reviewed the construction inspection program's organization, administration, and enforcement processes. (The evaluation did not include inspections of active construction sites or an evaluation of Caltrans' inspectors.) In addition, the evaluation reviewed the overall effectiveness of the program and stated that as a secondary goal acquired data would be used to assist in the re-issuance of the permit.

## **A Review of the Department of Transportation's Storm Water Management Program**

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In USEPA evaluations, program deficiencies are considered areas of concern for successful program implementation, whereas positive attributes are considered indications of overall progress in program implementation. Both deficiencies and positive attributes were identified in the evaluation. The two program deficiencies identified as the most significant were: Facility Pollution Prevention Plans that were not site-specific and did not include site maps; and the Regional Work Plan did not include measurable goals for storm water management plan implementation. Caltrans has corrected the first deficiency. The second deficiency requires the establishment of goals in the storm water management plan, which requires approval from the State Board. Neither Finance nor the regional board staff believes either of the noted deficiencies adversely affects implementation of the program; in the context of the entire program, the deficiencies were minor in nature. However, the State Board has indicated that the lack of development of measurable goals as required in Caltrans' management plan is a serious deficiency, and Caltrans will be notified of its noncompliance with this requirement.

The evaluation also noted two noteworthy elements: the program in District 5 is part of the Design Division, ensuring that storm water is considered during design and planning of projects; and there are three levels of construction inspections conducted for projects. An additional seven aspects of the program were defined as positive attributes. According to an official in the USEPA's Clean Water Act Standards and Permits Office, there have been no other technical evaluations completed of Storm Water Management Programs specific to the transportation sector.

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### **Caltrans is Having Mixed Success in Trying to Ensure Statewide Consistency**

One of the key management objectives of a statewide program is consistency in the application and interpretation of the program requirements. With regard to the statewide storm water permit, this task is made more difficult by the fact that individuals throughout the project delivery system are focused on project schedules and budgets—a typical focus for “construction” based organizations. In addition, some districts are overseen by as many as four different regional boards (See Exhibit 1, p.17), adding to the potential for differing approaches to pollution control strategies. This in turn can complicate implementation decisions for project delivery staff. Therefore, in an effort to stay on schedule and within budget, sometimes Caltrans staff has agreed to requests from the various regional boards that may be inconsistent with interpretations of Caltrans headquarters' staff. The State Board believes that these inconsistencies may arise from certain regional boards providing

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less rigorous oversight than other regional boards due to limited resources. The State Board does agree that as an agency it could be more consistent in its application of permit provisions, and in its level and degree of enforcement actions.

To keep field staff more informed on the requirements of the statewide permit and to remedy this situation, the headquarters storm water staff has increased the communication links with district storm water staff through electronic mail and the creation of web pages that address specific storm water permit issues. In addition, district staff have been encouraged to involve headquarters in requests from the regional boards that may be inconsistent with the statewide permit or State Board policies.

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### **Organizational Structure of the Program Varies**

Caltrans' storm water management plan describes a different program structure from the one that is actually in existence; moreover, the program structure varies from district to district. Based on interviews with Caltrans staff and a review of district organizational charts, none of the districts has a Storm Water Coordinator who reports directly to the District Director as reflected in the Storm Water Management Plan (see Chart 1, next page). Caltrans needs to take corrective action so that its management plan accurately reflects its organizational structure.

The organizational structure is organized at the discretion of the District Director (see Appendix F for Charts for several districts). Usually, the individual with the coordinator responsibilities is assigned to a functional area (i.e., Design, Construction, Environmental) and may have a dual role as a supervisor of construction, maintenance, or design staff. In addition, some districts have recently or are in the process of reorganizing the storm water program (see Appendix F for District 4's Proposed Organization).

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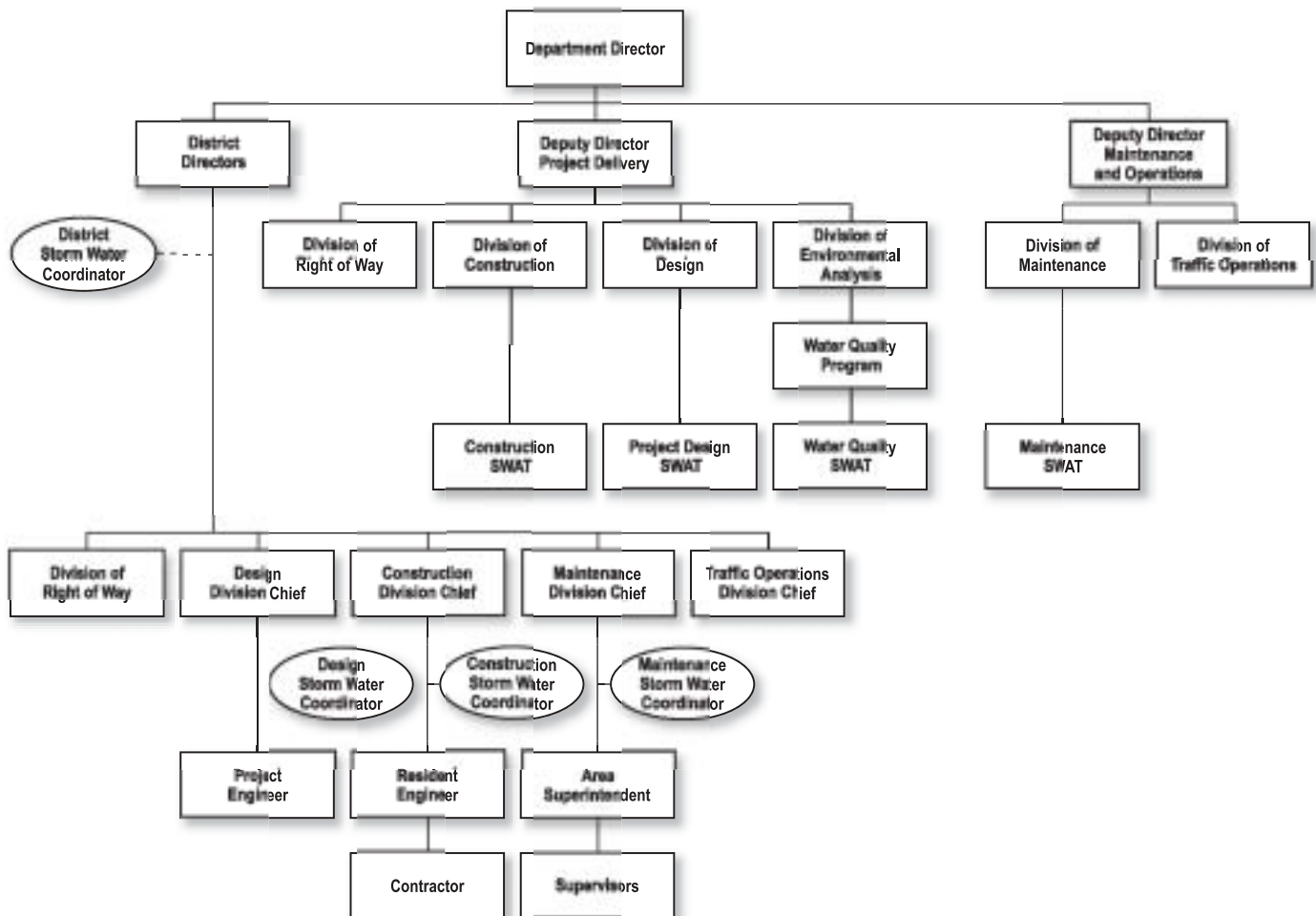
### **Some Staff Appear to Resist the Required Changes**

During interviews with district staff, several Caltrans employees indicated that they continue to be repeatedly challenged by other employees about the need for specific storm water requirements that they recommend being incorporated into the design and construction requirements for projects. This type of questioning can lead to delays in decision-making and has caused some frustration on the part of storm water management staff.

# A Review of the Department of Transportation's Storm Water Management Program

CHART 1

Caltrans' Functional Organization



During these same interviews, Finance observed a correlation between the acceptance of the storm water provisions and the knowledge of the litigation surrounding the Storm Water Management Program. As is the case with most large organizations spread over a wide geographical area, the exchange of information can be a major challenge. To address the issue of lack of understanding, the headquarters staff has instituted a training program for staff. However, Caltrans has had a difficult time tracking the number of employees trained by unit as well as the type of training. According to Caltrans' officials, some units trained employees but did not follow the required protocol for registering employees for classes

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and confirming the employees attended. Caltrans reports that it has since developed new instructions to ensure that more accurate tracking occurs.

In addition to increased training, each of the functional areas has updated or scheduled an update of its handbooks and manuals to incorporate the necessary storm water requirements.

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### **Caltrans Has Made a Concerted Effort to Integrate Storm Water Requirements into the Planning and Design of Projects**

Caltrans designs, constructs, manages, and maintains the State highway system, including freeways, bridges, tunnels, maintenance facilities and related properties, and facilities. Caltrans' management has made a concerted effort to ensure that construction efforts are in compliance with the statewide permit by incorporating storm water compliance into the processes that initiate construction projects, i.e., the planning and design phases of projects.

As part of this effort, Caltrans developed a new Project Planning and Design Guide in September 2002 that addresses key regulatory, policy, and technical requirements from the storm water management plan. The objective was to establish the overall process for selecting and designing best management practices for project planning and design processes, and for incorporating those best management practices into the appropriate documents. The guide includes best management practices for treatment of storm water, the design of projects, pollution prevention measures, and construction sites. The State Board believes that allowing the board to review and approve these types of internal documents, policies and procedures before they are finalized, could ensure that Caltrans would be in compliance with its permit requirements. The State Board also believes that this type of communication between the State Board and Caltrans could potentially save Caltrans a significant amount of resources (time and money) because Caltrans would be assured that the internal documents, policies, and procedures were in compliance with its permit. Caltrans does not believe that the State Board should have control over its internal documents, policies or procedures as that is the purview of its management team. According to Caltrans' management, the State Board has regulatory authority over its statewide NPDES permit, and if Caltrans' policies, procedures or internal documents violate the provisions of the permit, the State Board can take action against the department for noncompliance.

Caltrans will evaluate implementation of best management practices for all new construction and major reconstruction projects using the guide's procedures. Although some districts currently incorporate critical construction best management practices into project plans and specifications, Caltrans' headquarters has directed that all districts incorporate critical construction best management practices into project plans and specifications, and individual bid items for all projects ready to go out to bid on or after October 1, 2003. In addition, designers are encouraged to utilize individual bid line items for best management practices that have standard special provisions available. Caltrans' management purports and several staff concurred that the use of individual Bid Line Items results in more competitive and consistent bids for projects. In addition, Caltrans' construction staff stated that having temporary construction best management practices as part of the standard special provisions assists them in assuring that the contractors implement appropriate best management practices on the construction site. While the diligence of the contractors and the Resident Engineer, who oversees day-to-day construction activities, is vital to ensuring that storm water compliance requirements are met at the construction site, Caltrans is ultimately responsible for any noncompliance. However, it is the initial stages of the construction process — the planning and design of projects — integrate best management practices into the program, which provide the contractor and Resident Engineer with the tools necessary to successfully implement the storm water program.

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### **Caltrans Has Implemented New Data Collection Requirements**

Caltrans' storm water management plan requires it to document decisions of the design function by using a monitoring tool called the storm water data report. All projects advertised after January 1, 2003, are required to prepare a storm water data report that is initially prepared during project initiation, updated during the project approval and environmental process, and finalized when the project plans, specifications, and estimates are prepared. The report provides the following:

- A tracking system common to all districts for documenting implementation of storm water controls in projects.
- A mandatory storm water quality checklist for each project to be completed by the project engineers.
- Confirmation of checklist completion during the project constructability review.
- A means to generate regular reports by district staff documenting the storm water aspects of projects.



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An additional benefit from the report's data are that it provides a means for Caltrans to substantiate the decision-making process for best management practices and thereby provide a better defense in the event of subsequent litigation.

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### **Caltrans Has a Broad-based Research Program**

The Caltrans' Storm Water Management Program's approach to research has been based on the need to determine the characteristics of storm water runoff from roadways and facilities, effectiveness of different best management practices, and the effects of runoff on the beneficial uses of receiving-waters. This information is required by its statewide NPDES permit (See Appendix G for a list of Caltrans' research projects), but during the early years of the program, this information was unknown.

To obtain the information required by the statewide NPDES permit, Caltrans implemented a broad-based technical research program to identify and evaluate the universe of existing pollutant prevention and treatment best management practices, and began to characterize and identify the constituents requiring treatment under the Clean Water Act. In addition, Caltrans needed to evaluate the effectiveness of best management practices in reducing these constituents as was required by the Consent Decree. As Caltrans characterized constituents and identified promising best management practices, pilot studies were implemented to ensure the best management practices would perform within the highway environment. In addition, in its efforts to comply with the requirements of various lawsuits, Caltrans has and continues to perform specific storm water research activities. The State Board does not believe that Caltrans should always conduct pilot studies because much of the research has not resulted in significant changes to the design of the best management practices that were already in use by other municipal separate storm sewer systems and transportation departments throughout the country.

Caltrans is currently conducting full-scale pilot testing on 21 new technologies. Throughout the state, 121 full-scale and small-scale pilot studies utilizing these new technologies are being conducted. Caltrans has also prepared fact sheets for 31 new technologies that have been neither approved nor rejected and are not currently being considered for pilot testing.<sup>32</sup> It is possible that some of these new technologies not currently undergoing pilot testing will be considered in the future, since the assessments are ongoing.

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<sup>32</sup> A fact sheet presents summary information that Caltrans will use to evaluate the applicability of the new technology and determine if the new technology warrants the implementation of a pilot study.

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### **Caltrans Research Focus is Changing**

To date, Caltrans has approved numerous best management practices for use and continues to study additional best management practices (See Appendix H for more information). The best management practices are categorized by type (i.e., maintenance, construction, design, water quality) and are identified in the storm water management plan. Caltrans expects to continue identifying and developing new best management practices but will also be focusing on improving existing best management practices. According to Caltrans officials, after several years of study, the department has a good understanding of the constituents found in storm water and now needs to put more emphasis on refining the best management practices currently available. Caltrans hopes to develop and implement more best management practices that are efficient by making them “smaller, cheaper, and better.”

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# The Cost of Storm Water Compliance

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## Finding a Balance between the Costs and Benefits

As discussed earlier in this report, there are a number of regulatory and statutory requirements imposed on NPDES permittees to achieve the national goal to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”<sup>33</sup> Recognizing the delicate balance between achieving clean water and the need to be fiscally prudent, the USEPA has funded numerous studies on the cost/benefit of clean water. According to the USEPA, cost/benefit analyses are needed, “Because the nation’s resources are limited, and the USEPA seeks to direct those resources toward actions that will produce the greatest reductions in environmental risk. These analyses are an important tool in helping to manifest the financial benefits of compliance with environmental regulations.”<sup>34</sup> While the USEPA administers many other programs that require cost/benefit analyses to be conducted, the Clean Water Act does not require storm water permitting agencies, such as the State Board and regional boards, to conduct cost/benefit analyses when issuing storm water permits.

In May 2000, the USEPA released a report stating that clean water contributes billions of dollars to the economy each year by supporting tourism, shell fishing, manufacturing, irrigation, and technology. Asserting, “economic prosperity and environmental protection go hand in hand,” the report offers the following statistics for consideration:

- The public takes more than 1.8 billion trips to beaches, rivers, and lakes, contributing to the \$380 billion spent on recreation and tourism.
- The value of real estate along desirable water areas is nearly 30 percent greater than at similar inland properties.

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<sup>33</sup> Federal Clean Water Act

<sup>34</sup> <http://www.epa.gov/ebtpages/econocostbenefitanalysis.html>

- Manufacturers use about 13 trillion gallons of water each year, including the soft drink industry, which uses more than 12 billion gallons of water annually to make products valued at more than \$50 billion.

The report warns that the value of clean water should not be taken for granted: 40 percent of rivers, lakes, and streams surveyed remained too polluted for fishing or swimming and that 20 percent of drinking water systems report violations of health standards. Finance is unaware of any analyses conducted by the USEPA to quantify the economic consequences of not maintaining or achieving clean water.

Just as some USEPA studies emphasize the benefits of clean water, studies conducted by others have attempted to estimate the economic costs of complying with storm water requirements, and have concluded that compliance with requirements will have a major negative economic impact on local municipalities. The University of Southern California (USC) recently conducted one such study. The study was commissioned by 20 cities in the County of Los Angeles operating municipal separate storm sewer systems (MS4s) located within the Los Angeles County Flood Control District. The study concludes there will be a major negative economic impact on the Los Angeles region for meeting storm water requirements.

The study brought together a multidisciplinary team of experts who were asked to provide an independent, comprehensive assessment of the regulatory requirements and projected storm water treatment costs in the Los Angeles region. Although none of the current municipal storm water permits require advanced treatment of storm water, the study concluded that: "It is quite feasible, indeed likely, that the ultimate public policy result to these simultaneous requirements will be advanced treatment of storm water and urban runoff."<sup>35</sup>

The assumption of advanced treatment is significant. Advanced treatment means Level 3 treatment, which is defined as reverse osmosis, followed by screening, detention filtration, and disinfection. Storm water treated at Level 3 would be free of almost all constituents of concern and likely suitable for all beneficial uses.<sup>36</sup> For storm water to be treated to this level, a large number of new purification plants, which are expensive to build and operate, would be required. It is important to note that the State Board has not required this level of treatment in the past, and has stated it does not intend to "dramatically shift its regulatory approach".

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<sup>35</sup> [www.citiessavejobs.com/dynamic/downloads/individual\\_download\\_file\\_link\\_english\\_175.pdf](http://www.citiessavejobs.com/dynamic/downloads/individual_download_file_link_english_175.pdf)

<sup>36</sup> Cost of Storm Water Treatment for California Urbanized Areas, Brown and Caldwell, 1998

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Given the assumed need for Level 3 treatment, the report stated, “Over the twenty-year period analyzed in the report, most communities in the greater Los Angeles area will experience very significant employment and net economic losses caused by the new storm water regulations. The region as a whole is projected to lose from 27,000 to 214,000 full-time jobs per year and suffer a net economic loss of \$23 billion to \$170 billion to collect and treat intermittent storm flows.”<sup>37</sup> The USC and USEPA studies underscore the divergence of opinions on the economic implications of complying with environmental regulations related to clean water.

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## **The Projected Costs of Compliance Are Escalating**

Storm water compliance requirements have become increasingly specific, and as a result Caltrans’ Storm Water Management Program costs have escalated, the effect of those increasing costs on Caltrans’ transportation funding sources have been the subject of discussions with Caltrans officials during the budget development process. During those discussions, Caltrans referenced a 1998 study, Cost of Storm Water Treatment for California Urbanized Areas, prepared for it by the environmental engineering firm of Brown and Caldwell that estimated the costs to comply with the applicable water quality standards for the Los Angeles basin at \$53.6 billion. The recently conducted study by USC updated the Brown and Caldwell projected costs and now estimates the compliance costs at \$102 billion.

The cost of complying with NPDES storm water requirements has been a concern often expressed by Caltrans as well as local municipalities and cities. As the State and federal requirements have become more stringent, permittees have questioned whether the costs exceed the “maximum extent practicable” provisions of the NPDES program. Based upon review of relevant court actions, articles authored by individuals associated with storm water administration, it is apparent that the potential costs of compliance were the first line of legal defense against implementing what program administrators argued as costly additions that provided “little or no environmental benefit in return.”<sup>38</sup> Given this approach, the Brown and Caldwell study as well as the USC study have been widely quoted by some local municipalities, cities, and Caltrans as an example of the exorbitant costs of storm water compliance.

On the other hand, State regulators and environmental groups have been highly critical of the studies and characterized the results as inflated and unrealistic because they believe the studies are not based on empirical evidence of actual compliance costs, but

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<sup>37</sup> [http://www.citiessavejobs.com/dynamic/downloads/individual\\_download\\_file\\_link\\_english\\_175.pdf](http://www.citiessavejobs.com/dynamic/downloads/individual_download_file_link_english_175.pdf)

<sup>38</sup> <http://www.citiessavejobs.com/keyfacts/faqs.asp?key=4>.

on an assumption that strict compliance with water quality standards would be required rather than the iterative best management practice-based program currently utilized. The degree to which regulators and environmental groups aggressively rebut any discussion of prohibitive costs associated with environmental compliance underscores the sensitive nature of the issue of cost/benefit. In the case of Caltrans' storm water compliance, the two competing interests are the effects on the environment and the cost of constructing and maintaining highway projects.

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### Projecting Long-term Costs Is Difficult

In its role of reviewing budget requests, Finance has been interested in determining whether there are ways to project long-term storm water program costs for Caltrans. Therefore, staff for this study analyzed data from various sources to determine if a trend projection can be constructed and what other states have found relative to program costs. The Washington State Department of Transportation in collaboration with the Washington State Department of Ecology conducted a storm water management study to develop storm water management recommendations. The findings are similar to other states findings. The study found that "storm water and compliance costs are large but unquantifiable."<sup>39</sup>

With regard to a trend projection, the literature indicates that the trend in the long-term costs for surface water protection from pollutants is certainly toward higher costs as the regulatory requirements are developed and interpreted by the courts pursuant to litigation. Costs have historically moved upward in waves as major programs are developed. For example,

- Point source wastewater treatment moved quickly forward in the 1970's after the passage of the Clean Water Act and with the federal and State grant funding programs.
- Enhanced treatment for more point source contaminants followed in the 1980's.
- Combined sewer and separate storm water regulations became a focus in the 1990's.
- Total maximum daily loads, which are discussed later in the report, are currently becoming the driving force for more stringent standards for watershed protection and improvement.

A meaningful discussion of the implications of Caltrans' storm water compliance costs requires an understanding of Caltrans expenditures for the program. The following

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<sup>39</sup> Final Report to the Washington State Legislature, Washington Storm Water Management Study, Report and Recommendations from the Storm Water Policy Advisory Committee, September 2001.

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sections address Caltrans' expenditures from the standpoint of program administration and construction costs.

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### **Administration Costs Have Increased and Costs are not Easily Identified**

A separate appropriation item was created in the 1999 Budget Act to help track administrative costs for Caltrans' storm water compliance efforts. This tracking coincided with the first major funding augmentation Caltrans received for compliance with NPDES storm water permit requirements and compliance with court orders. The Budget Act Item (2600-007-0042) appropriated funding for maintenance, research, training, and administration. The appropriation has increased nearly 130 percent over the past four years (See Table 5).

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**TABLE 5**

#### **Caltrans' Budget Act Appropriations**

<b>Fiscal Year</b>	<b>Appropriation (Millions)</b>
1999-2000	\$37.9
2000-2001	\$61.5
2001-2002	\$61.5
2002-2003	\$87.0

Caltrans staff informed Finance that not all costs for storm water related support activities are included in the Budget Act item and that some of these additional costs cannot be quantified. The main reason that costs cannot be quantified is that many activities are inter-related, such as the design of storm water components, hydraulic evaluation of conveyance systems, slope design and stabilization, etc.

Although there are specific storm water activity codes, these are a subset of the available codes, and it can be difficult to distinguish among these inter-related activities. Caltrans' Storm Water Management Program affects costs in many of its functional areas (Design, Construction, Maintenance, Environmental, Right-of-Way, and Operations) both at the headquarters level and at the district level. For example, storm water compliance is one of a number of requirements taken into consideration when a project is being designed. Project Engineers consider storm water requirements throughout the planning and design phases of every project. It can be difficult for designers to distinguish the exact amount of time within the design that was specifically dedicated to storm water requirements.

For maintenance workers it is easier to identify maintenance activities that are solely related to storm water compliance. However, if an activity is only partially attributable to storm water compliance, it is up to the discretion of the individual to apportion time spent by purpose. These timekeeping challenges make it difficult for Caltrans to answer questions regarding storm water expenditures with a high degree of accuracy.

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### **Research and Technical Assistance Costs**

The one area that Caltrans does seem to have a more accurate accounting of costs is in the area of storm water related research. Caltrans spent approximately \$128 million in fiscal years 2001-02 and 2002-03 for storm water research, applied studies, and technical assistance for the Storm Water Management Program, and it plans to spend even more over the next several years. Caltrans has interagency agreements with various universities and contracts with consultants and others to conduct the research, analyze the findings, and assist with implementation. During fiscal years 2001-02 and 2002-03, Caltrans had interagency agreements with California State University, Sacramento and the University of California at Irvine and Davis, the Department of Health Services, and contracts with eight other companies, and spent approximately \$37.4 million for research and applied studies. Approximately \$14.6 million of the encumbered amount was spent to satisfy the research study requirements of various lawsuits. In addition, Caltrans spent approximately \$90 million in fiscal years 2001-02 and 2002-03 for Storm Water Management Program planning and implementation.

For fiscal years 2003-04, 2004-05 and 2005-06, Caltrans expects to spend approximately \$150 million for research, applied studies, and technical assistance for the Storm Water Management Program. Approximately \$40 million will be provided for ongoing and new research and applied studies (See Table 6).



TABLE 6

**Research and Applied Studies for Fiscal Years  
2003–04, 2004–05, and 2005–06**

Activity Title	3-Year Planning Period		
	2003–04	2004–05	2005–06
<b>Specialized Characterization Studies</b>			
California Toxics Rule Characterization Study	\$750,000	\$0	\$0
First Flush Characterization Study	\$200,000	\$0	\$0
<b>Storm Water Treatment Technology Research</b>			
Pilot Studies	\$13,000,000	\$12,000,000	\$12,000,000
<b>Erosion Control and Research</b>			
Seed Mix and Vegetation Establishment Summary	\$275,000	\$275,000	\$275,000
Piloting Soil Stabilization: Permanent	\$300,000	\$300,000	\$300,000
<b>Total</b>	<b>\$14,525,000</b>	<b>\$12,575,000</b>	<b>\$12,575,000</b>
<b>3-Year Total</b>			<b>\$39,675,000</b>

The remaining \$110 million will be expended through several 3-year technical assistance contracts. These contracts will provide assistance with revisions to the permit and storm water management plan, policy guidance, public education, transportation planning, and assistance in the field.

### **Storm Water Construction Costs Are Funded from the State Highway Account, but Are Not Easily Identified**

Not only have administrative costs for storm water compliance increased, but the costs associated with the construction of projects have also increased. The administrative costs for implementing the Storm Water Management Program are contained within Caltrans' budget, but the construction costs are contained within the State Highway Account (SHA). As the main funding source for California's Highway Transportation program, the SHA funds most of the cost of storm water compliance. SHA revenue comes primarily from excise taxes on motor vehicle fuels, truck weight fees, and Federal Highway Trust Funds. The primary planning tool for State allocation of resources for transportation

## A Review of the Department of Transportation's Storm Water Management Program

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projects is the State Transportation Improvement Plan. This plan is based on a periodic estimate of available resources in the State Transportation Improvement Fund Estimate minus reservations for costs such as Caltrans operations. (The latest fund estimate projected available funding for fiscal years 2002-03 through 2006-07.) The fund estimate has two major components that include storm water related costs: State Highway Operations and Protection Program (SHOPP) capital outlay expenditures and the State Transportation Improvement Program (STIP) capital outlay expenditures. SHOPP projects include highway emergency, safety, seismic, preservation, rehabilitation, restoration, betterment, and mitigation projects. STIP projects are those transportation projects that are typically characterized as increasing the capacity of the highways.

Within the State Transportation Improvement Plan Fund Estimate, the SHOPP capital outlay expenditure category includes a line item for storm water expenditure that appears to reflect the resources needed to ensure compliance with the conditions and requirements of the statewide NPDES permit. While this definition would seem to indicate that the figures represent the full range of costs within the State Transportation Improvement Plan Fund Estimate, this is not the case. The figures represent storm water only projects, which are projects that are built exclusively to mitigate storm water and are not considered transportation improvement projects. For example, a storm water only project would be the construction of a litter removal device that is not installed in conjunction with a highway construction project. The latest fund estimate projects \$291 million available for storm water only projects included in the SHOPP category from 2002 through 2007. Caltrans has stated that this estimate is not sufficient to fund the inventory of storm water only projects that are necessary. In addition, Caltrans staff indicated that storm water only projects are not the highest priority projects of those identified in the SHOPP. The storm water only projects rank behind projects involving safety and preservation. If revenue estimates fall short of the projection, fewer storm water only projects would be funded, thereby increasing the number of unfunded projects in the inventory.

Storm water costs are also a component of the STIP capital outlay expenditures category within the State Transportation Improvement Plan Fund Estimate, although they are not separately identified as a line item. As discussed above, the STIP capital outlay expenditure category does not specify the amount of storm water costs associated with transportation projects. Each project will have a storm water component, such as temporary construction,

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design, and treatment best management practices. While the costs associated with temporary best management practices are easier to track, design and treatment best management practices are more difficult to track. In many situations, design and treatment best management practices are included in the design of the project and are not readily separated from other costs (see Appendix H for best management practices costs). For example, the contractor does not necessarily distinguish between the costs associated with materials used to construct a roadway and the permanent and/or treatment best management practice. Therefore, Caltrans is unable to provide an accurate accounting of the storm water costs associated with construction of transportation projects.

Recognizing that the inability to accurately account for storm water compliance costs is problematic, Caltrans storm water program management has begun to track costs and has implemented a system for estimating storm water compliance costs in new projects. A method for tracking critical best management practices has been established. For every project ready for bid on or after October 1, 2003, these costs will be tracked because they are included as part of the plans, specifications and individual bid items in every contract.

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### **Caltrans Has Implemented a Process for Estimating Storm Water Construction Costs**

While it is difficult to accurately project total storm water compliance costs, Caltrans has attempted to estimate and capture the costs of storm water compliance to assist in project planning. The Project Planning and Design Guide describes four methods for estimating costs: percent of total project cost, historical project information, estimated unit cost sample, and actual unit cost. Based on the actual costs of projects completed in the past few years, the Project Planning and Design Guide provides planners with a tool to assist in estimating best management practices as a percentage of total costs for the Project Initiation Document (PID) process. Although, best management practices are selected and refined throughout the design process, best management practices are first selected during the PID process and the costs are estimated. During the Project Approval/Environmental Document (PA/ED) process, the Project Planning and Design Guide suggests that using historical project information and estimated unit cost sample would be the best options for estimating best management practice costs. During the Plans, Specifications, and Estimates (PS&E) process, the Project Planning and Design Guide suggests that estimated unit cost sample and actual unit cost would be the best options for estimating the costs for the selected best management practices.

## A Review of the Department of Transportation's Storm Water Management Program

The Project Planning and Design Guide provides percentages to be used during the PID process for estimating the cost of construction site best management practices as a percentage of total project costs (see Table 7 below). The percentages appear high as compared with a sample of projects provided to Finance (see Appendix H, page 115 for best management practices cost section). Although, the Project Planning and Design Guide appears to be a valuable tool for planners, Caltrans will need to ensure all appropriate personnel are trained on how to use it, and the percentages will need to be reviewed at least annually so they can be refined as needed.

**TABLE 7**

### **Costs of Construction Site Best Management Practices As a percentage of Total Construction Costs**

<b>Type of Project</b>	<b>% of Total Construction Cost for Projects less than \$2,000,000</b>	<b>% of Total Construction Cost for Projects over \$2,000,000</b>
<b>Projects that involve work near 303d listed water body</b>		
Minor work such as resurfacing	3%	2%
Work that will require structural (treatment) BMPs	4%	3%
New facilities/renovations if total maximum daily loads have been established (includes treatment best management practices)	6%–10%	4%–7%
<b>Construction of Highway projects</b>		
New project with a large percentage of structure work	3%	2%
Freeway highway widening in rural area	4%	3%
Freeway highway widening in urban area	5%	3%–4%
Projects with considerable staging, borrow/fill sites, and unbalance projects	6%	4%
<b>Landscaping projects</b>		
Projects with new planting and irrigation that involve large areas of clearing and grubbing for new ground cover planting	10%	10%
Projects (new and rehabilitation) that involve clearing and grubbing adjacent to water bodies	15%	15%

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In addition, the Project Planning and Design Guide suggests that other costs also be estimated, including costs to develop a storm water pollution prevention plan or water pollution control plan, costs associated with sensitive environments, highway planting contract costs, and contingency monies to cover additional best management practices potentially required over the estimated amount. It should be noted that costs such as landscaping and erosion control were costs incurred for projects before the storm water program was implemented. These costs, however, are an integral part of storm water compliance.

After reviewing all the issues surrounding the costs of storm water compliance, the Department of Finance continues to be concerned. The Department of Finance recognizes that the balance between costs and benefits is a difficult policy decision. In highlighting this issue, it is not the Department of Finance's position that the cost of compliance should be the overriding concern, but that there needs to be a recognition of the trade-offs associated with resource allocation decisions given the limited resources. While there is no doubt that there are definite benefits to improving our State's waters, the fiscal impact on Caltrans' transportation funding cannot be ignored.

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## Emerging Issues

Storm water compliance is occurring within a dynamic regulatory and legal framework. As such, Caltrans must deal with some significant issues, including the development of total maximum daily loads, standard urban storm water management plans, California's Toxic Rule and the Endangered Species Act. In addition to these specific issues, there is a general perception on the part of permittees that the permit requirements are becoming more numerous. The State Board believes that requirements beyond those established in the federal regulations are not being imposed, however, more specific requirements are being imposed as the State Board seeks to clarify existing regulatory and statutory requirements.

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### Total Maximum Daily Load

The Clean Water Act requires that a calculation of the maximum allowable pollution also known as the total maximum daily load (TMDL) be developed for any water on the 303(d) list: a list of waters where pollution levels have exceeded water quality standards. A total maximum daily load is a measurable goal that describes the amount of pollutants allowable in a water body while still meeting the water quality standards. The permit requires that Caltrans adhere to the total maximum daily loads developed, if applicable, by implementing best management practices. Determining applicability can be difficult. Land ownership (roadways), specific pollutants that are associated with highways<sup>40</sup> found in a waterway, or drainage into a waterway could require that Caltrans implement best management practices to attain acceptable total maximum daily loads.

A total maximum daily load may include standards for: sediment, temperature, metals, bacteria, solids, etc. There are numerous pollutants of concern and many are difficult

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<sup>40</sup> Mercury in diesel exhaust, cadmium and zinc from tire wear, copper from brake pads, lead from gasoline, and others.

to treat or manage including metals, nutrients, bacteria, and organics (i.e., herbicides, pesticides). In addition, implementation of a total maximum daily load may not bring a water into conformity with standards, and if this occurs, the total maximum daily load and the best management practices employed to achieve the standard(s), will be revised. This iterative process requires regular evaluation and monitoring. A permittee such as Caltrans may need to revise established best management practices and adopt new best management practices in its continuing attempts to achieve compliance.

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### **Beneficial Uses Are Key to the Development of Total Maximum Daily Loads**

In the development of total maximum daily loads, the beneficial use designations of the water body are considered. All fresh waters are designated as potential drinking water sources unless otherwise exempted. In addition, most surface waters have designations for body contact recreation that have bacteria standards, and habitat designations that may have low level toxicity requirements.

The Clean Water Act requires the regional boards to protect beneficial uses, and achieving the objectives for the water body could be costly. According to Brown and Caldwell, current regulatory practice requires the use of source control, non-structural best management practices including natural storm water attenuation features and low-tech treatment best management practices to achieve storm water and total maximum daily load goals. The continuation of this practice may be unlikely as total maximum daily loads recently written for metals, organics, and bacteria by the regional boards have implemented a stringent interpretation of the water quality necessary to protect beneficial uses according to the Porter-Cologne Act. Several total maximum daily loads recently adopted that have strict limitations include the trash total maximum daily load for the Los Angeles River, and the bacteria total maximum daily loads for the Santa Monica Bay beaches. For example, the trash total daily maximum load for the Los Angeles River was set to zero trash, which means that permittees shall implement best management practices that are designed to allow no trash to enter into the river from their storm water outfalls. While the implementation schedule allows for the permittee to reduce trash by ten percent each year over ten years, the requirement that zero trash enter the river is clearly perceived as a strict limitation. (Dischargers can also install capture devices, and not be subject to the percentage reductions or zero target.)



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## **Cost of Implementing Total Maximum Daily Loads is Unknown, But Significant**

The cost to Caltrans of implementing total maximum daily loads is largely unknown as is the number of total maximum daily loads to which Caltrans will be required to adhere. In District 7, two trash total maximum daily loads became effective in June 2002. The total maximum daily loads require that trash in storm water discharges for the Los Angeles River and Ballona Creek be reduced by 10 percent each year for the next ten years until the goal of zero trash from storm water outfalls is achieved. Caltrans has estimated the cost of implementation for the first three years to be approximately \$100 million. For years four through ten, the cost is estimated to be a minimum of \$35 million per year.

In addition, in District 7, a bacteria total maximum daily load has been established for Santa Monica Bay beaches. The bacteria total maximum daily load is based upon the number of days the acceptable level of bacteria in the water is exceeded. The cost of implementing this total maximum daily load is unknown as the best management practice(s) used to achieve the standard is currently unknown. In addition, the level of responsibility assigned to Caltrans or any other permittee is also unknown. Although the costs for implementation of total maximum daily loads are unknown, they will likely be significant. A driving force behind rising costs for the Caltrans' Storm Water Management Program will be implementing total maximum daily loads.

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## **Caltrans Will Need to Coordinate with Other Jurisdictions for Implementation of Watershed Total Maximum Daily Loads**

To date, Caltrans' Storm Water Management Program has focused on property and drainage systems under its direct control utilizing best management practices that do not require regional coordination. As watershed based total maximum daily loads are implemented, Caltrans and other jurisdictions will be required to share the cost of best management practices that serve these multiple jurisdictions. According to Brown and Caldwell, "It is anticipated that the costs will be allocated based on quantity and/or quality of runoff from the properties in the total maximum daily load area. For example, the allocation could be based on percent of impermeable surface as a close approximation of the relative quantity of runoff coming from each area. If the best management practice chosen to meet the regulatory requirements is flow based, this method could be appropriate. A more precise allocation could be developed through sampling and apportioning the cost based on the relative quality based on pounds of pollutant from the properties. This method would be

similar to the load allocation in the total maximum daily load. A quality based allocation would cause Caltrans to contribute a greater share for pollutants generally attributed to motor vehicle activities such as lead residue from leaded gasoline but contribute a lesser share for pollutants associated with people and animals such as bacteria.”

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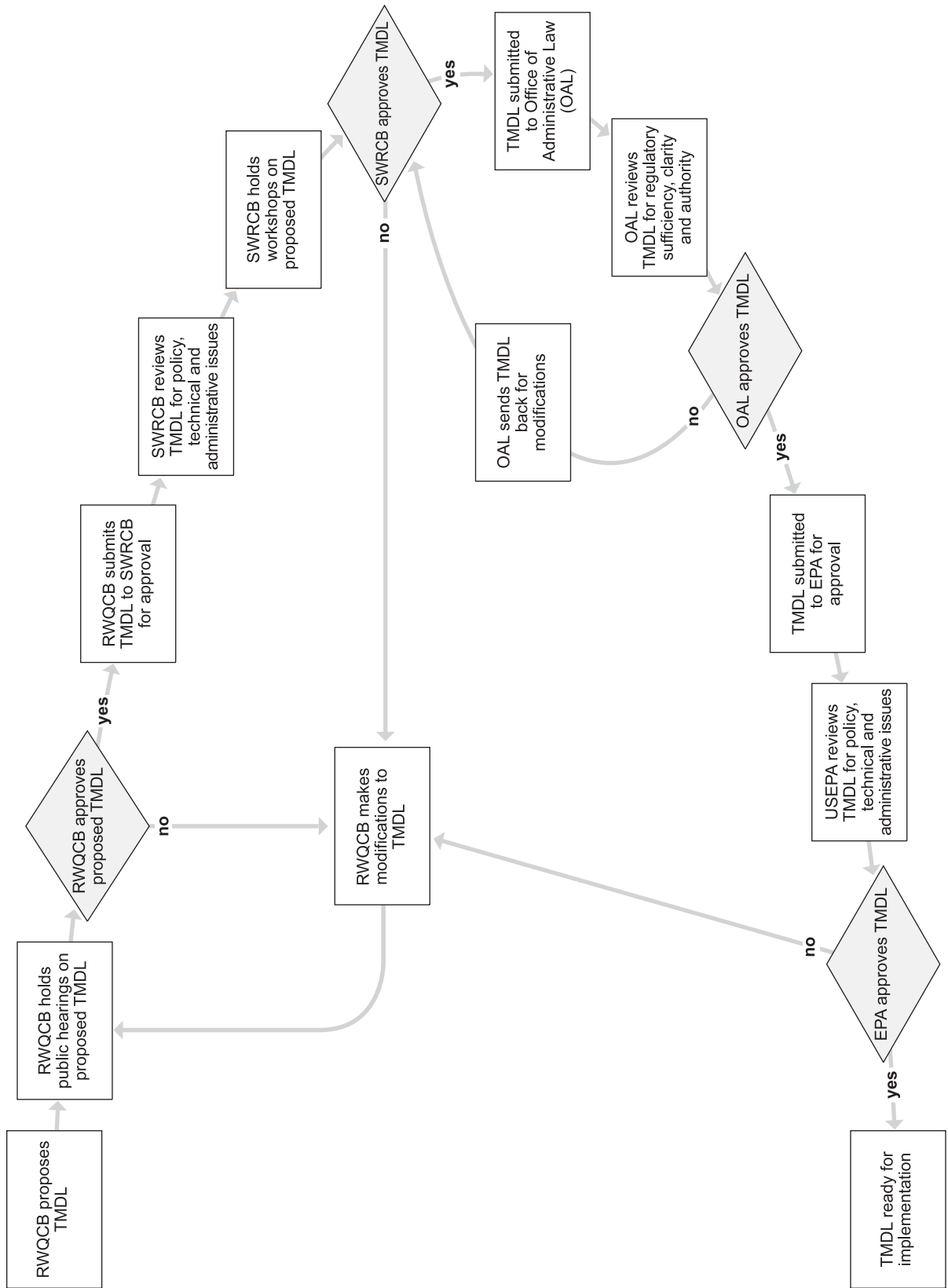
### **Implementation Process for Total Maximum Daily Loads Is Lengthy**

The implementation of a total maximum daily load is a formal and lengthy process. The regional boards conduct a public hearing to review policy and technical implications of a total maximum daily load. If the regional board approves the total maximum daily load, it submits it to the State Board for review and approval. The State Board holds a workshop on the proposed total maximum daily load and eventually votes to accept or reject the proposed total maximum daily load. If accepted by the State Board, the proposed total maximum daily load is submitted by the State Board to the Office of Administrative Law (OAL) for review and approval. If approved by the OAL, the total maximum daily load is submitted by the State Board to the USEPA for its approval. If rejected during any of the approval process, the total maximum daily load would be sent back to the submitting agency for changes (see Chart 2 for process). According to the State Board, it takes an average of four years to prepare and adopt a total maximum daily load.

As additional TMDLs are implemented, the costs for complying with the TMDL requirement will increase. If fewer TMDL projects are approved due to budgetary constraints, the costs associated for permittees to implement the TMDL projects would not be incurred until the TMDL projects are approved.

Recently, the USEPA approved the 2002-303(d) list that revised the number of water body/pollutant combinations on the 1998-303(d) list. The list now contains 1,883 water body/pollutant combinations, 400 more combinations than those found on the 1998-303(d) list. The State Board has developed a long-term schedule for the development of total maximum daily loads that does not to extend beyond 2013. This schedule, however, will most likely represent only when the regional boards are expected to consider the total maximum daily load, as is the case for the 303(d) list adopted in 1998. The number of total maximum daily load projects has not yet been updated, but the number will be higher than the 383 total maximum daily load projects associated with the 1998-303(d) list. The State Board expects to approve five additional TMDL projects this calendar year.

## The Total Maximum Daily Load Process



A total maximum daily load project is the method used by the State Board to combine the segments of water body into an identifiable group for the purpose of addressing a total daily maximum load. In other words, a river may have ten segments all of which are impacted by sediment, but instead of dealing with each segment individually the segments are combined into one project. Currently, 25 total maximum daily load projects have been approved for California waters with 40 percent of those for the Los Angeles Regional Water Quality Control Board. An additional 14 total maximum daily load projects have received regional board approval, but have yet to be approved by the USEPA.

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### **Standard Urban Storm Water Mitigation Plans Have More Stringent Pollution Control Requirements**

The immediate trend in the urban storm water permits that are being proposed and adopted by California regional boards is a focus on aggressive source control through inspections, public education, monitoring, street sweeping, training, construction site control, industrial site control etc., and mitigation plans for new development and redevelopment. The mitigation plans, which are not new requirements, clarify the regional boards' expectations regarding the federal regulatory requirement that municipal separate storm sewer system permittees have a comprehensive master plan to reduce the discharge of pollutants from areas of new development and significant redevelopment. These plans are generally known as standard urban storm water mitigation plans. The standard urban storm water mitigation plans generally require mitigation of storm water pollutants to the "maximum extent practicable" from new or redeveloped projects. In some permits, this definition includes roadway construction and rehabilitation. The mitigation plans must meet the specific requirements of the standard urban storm water mitigation plan and will require facilities to hold and treat or to infiltrate runoff from rainfall events exceeding specific thresholds. Although the site-specific mitigation plans are required only for the specific new projects, permittees are also required to develop broad based storm water management plans for jurisdictional areas or watersheds. These plans are based on the iterative principal that permittees keep trying best management practices and observing the results until water quality standards are achieved. The permittees must decide what best management practices to implement, but the target dates for the achievement of water quality goals are not date specific.

The Los Angeles Regional Water Quality Control Board has issued storm water permits with standard urban storm water management plan provisions. These permits have become the

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basic model that has been used and modified to develop similar permits in San Diego and the Bay Area. These permit provisions have been challenged at the State Board level on several grounds and the challenges have been generally rejected or only slight modifications made to the permit.

As indicated, standard urban storm water management plan provisions were initiated by the Los Angeles Regional Water Quality Control Board and have generally been added to other municipal separate storm sewer system permits as they are renewed. They require minimum best management practices for new development and redevelopment for designated types of projects. In Los Angeles the designated projects are:

- Residential hillside development and all subdivisions greater than 10 units.
- Commercial development greater than 100,000 square feet. Automotive repair and gas stations, and restaurants.
- Parking lots larger than 500 square feet.
- Locations discharging to an environmentally sensitive area.

The regulations require that the development or redevelopment include several design features that regulate the project planning and mitigate storm water pollution. They include:

- Post-development runoff rates cannot exceed the pre-development rate.
- The site should conserve natural areas, and slopes and channels should be protected from eroding.
- Pollutants of concern must be reduced in the runoff to the maximum extent practicable standard. The facilities must be designed for the runoff from a 0.75-inch storm or the 85<sup>th</sup> percentile 24-hour runoff event.
- Properly design outside material storage to minimize pollution.
- Provide proof of ongoing best management practice maintenance.

As written, the standard urban storm water management plan provisions do not apply to Caltrans since it does not regulate public properties or roadways. However, the basic intent is to require the incorporation of significant best management practices into the planning process for the development or redevelopment of projects that the State Board considers important sources of storm water pollution.

The Los Angeles Regional Water Quality Control Board standard urban storm water management plan requirement has been incorporated into permits issued by other regional boards and permits. The San Diego Regional Water Quality Control Board municipal separate storm sewer system permit requires standard urban storm water management plans for the same types of development as Los Angeles and extends it to municipal facilities and roadways that increase paved area by more than 5,000 square feet. The State Board has also incorporated the Los Angeles standard urban storm water management plan language into the draft small municipal separate storm sewer system general permit for the areas with a population greater than 50,000.

The requirement to treat runoff from new and redevelopment projects appears to be a standard for new permits. Caltrans does have facilities that include truck maintenance activities, park and ride parking lots and roadways in hillside areas, and environmentally sensitive areas. The standard urban storm water management plan concept has already been extended to Caltrans and is incorporated into its current plan by requiring best management practices to treat runoff to the maximum extent practicable standard for new and rehabilitation projects. The requirement may include all roadway projects or just projects considered sensitive due to the location or specific activities such as vehicle fueling or maintenance. If and when requirements of SUSMPs increase or become more specific, Caltrans may expect those changes to be reflected in its permit.

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### **California's Toxicity Rule May Add Additional Pollution Control Requirements**

In 2000, the USEPA adopted the California Toxics Rule, which sets very low numeric water quality standards for the concentrations of listed chemicals in water bodies. The concentrations are set to protect the habitat for aquatic life based on scientific studies of impacts. There are numerous questions about the applicability of the standards to a storm water event including mixing zones, exposure time, and interaction of the chemicals. However, the levels have been widely used as conservative values and development of new values is unlikely. The levels may form the basis of the total maximum daily load allocations. In an extreme case, chemicals listed due to the California Toxics Rule, may, in the future, have numeric water quality limits from storm runoff. Due to the connotation of "toxic," there is public support for their regulation. Again, California roads may be sources of metals worn from automobiles, organics from herbicides, and petroleum product residuals from fuels and lubricants. Both source control and treatment of these pollutants are difficult.

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## **Endangered Species Act**

Protection of endangered species can be the driving force for special design features to prevent any impact of construction and permanent facilities on habitat. If the endangered species is aquatic, storm drainage from projects, including Caltrans projects, may need to be prevented from flowing into the water. In an extreme case where the drainage cannot be diverted, treatment might be required. The effects would be specific to the endangered species. Endangered species requirements have not been part of storm water permits and are not generally regulated through water quality regulations. The Endangered Species Act could conceivably be the basis for an action by a federal agency against Caltrans or other storm water dischargers.

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# Findings and Recommendations

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## Program Administration Issues

Each of the following recommendations has been cross-referenced to the pages in the report where the issues have been discussed.

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### Finding 1

Caltrans must comply with the storm water requirements set forth in its statewide NPDES permit, which is regulated by the State and regional boards. Implementation of storm water requirements also cross the jurisdiction of numerous agencies including the Army Corps of Engineers, Coastal Commission, Department of Fish and Game, and others, requiring Caltrans to comply with their requirements as well.

Recommendation: Caltrans should continue to strive for consistency in the implementation of storm water requirements across all districts. Caltrans should also evaluate the requirements of other agencies to determine if those requirements conflict with its permit. If a conflict exists, Caltrans should attempt to resolve the conflicting requirements. *Page 24*

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### Finding 2

Although Caltrans has a statewide permit, it is regulated by the nine regional boards and must comply with their requirements.

Recommendation: Caltrans should explore the possibility that they be regulated at the State Board level versus the nine regional boards. *Page 28*

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### Finding 3

In some instances, Caltrans has very little latitude on how to implement pollution control technologies. These limitations are primarily the result of litigation and court rulings.

Recommendation: Caltrans should continue to monitor relevant court actions and develop an overall litigation strategy to defend the department against future lawsuits including increased coordination with other permittees, where appropriate. In addition, Caltrans should continue to focus on complying with its permit and implementing its management plan. *Page 31*

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### **Finding 4**

There were relatively few enforcement actions for a program as large in scope and breadth as Caltrans Storm Water Management Program, but the actions are not well tracked as evidenced by the discrepancy in the number of actions recorded by the State Board and Caltrans.

Recommendation: Caltrans should develop a means to document and track enforcement actions on a timely basis. *Page 37*

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### **Finding 5**

The USEPA Region 9 commissioned a program evaluation of Caltrans District 5 (Central Coast) Storm Water Management Program to determine the level of compliance with the provisions of the NPDES Permit and the storm water management plan. The evaluation found only minor deficiencies. However, the State Board does not agree that a lack of measurable goals within Caltrans' management plan is a minor deficiency, and will be notifying Caltrans of such.

Recommendation: No additional action is necessary in that Caltrans has begun to implement the appropriate corrective actions. *Page 39*

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### **Finding 6**

Caltrans is having mixed success in trying to ensure statewide consistency in the interpretation and application of the statewide permit requirements.

Recommendation: Caltrans needs to recognize a stronger role for its Headquarters whose responsibility is to ensure statewide consistency. Caltrans should continue working with the State and regional boards to improve communication and coordination. *Page 40*

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### **Finding 7**

The organizational structure of the program varies from district to district, and is different from the program structure described in the storm water management plan.

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Recommendation: Caltrans should modify the information in the storm water management plan to reflect the correct organizational structure or Caltrans should organize the Storm water Management Program consistent with the storm water management plan. *Page 41*

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### **Finding 8**

Some staff appear to resist the required changes to Caltrans' project delivery processes that are necessary to bring the department into compliance with the statewide permit. This resistance appears to be due to a lack of knowledge on the program requirements.

Recommendation: Caltrans should continue its increased level of training to insure that program staff is sufficiently aware and knowledgeable about the program requirements. In addition, Caltrans needs to improve its tracking of individuals trained as well as the subject matters in which staff are receiving training. *Page 41*

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### **Finding 9**

Caltrans has made a concerted effort to integrate storm water requirements into the planning and design of projects.

Recommendation: Continue to update storm water requirements to incorporate them into the planning and design of projects. *Page 43*

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### **Finding 10**

Caltrans has implemented new data collection requirements to assist the department in documenting how each best management practice is selected for incorporation into each project design.

Recommendation: Caltrans should evaluate the new data collection requirements after a reasonable period of time to insure that information collected is accurate and of value. *Page 44*

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### **Finding 11**

An overall lack of knowledge of storm water constituents, as well as requirements of court orders, has driven Caltrans' need to spend significant amounts of money on general research efforts, instead of focusing on applied research specific to Caltrans' immediate needs.

Recommendation: Now that Caltrans has acquired a significant amount of knowledge about the constituents found in storm water, Caltrans should change the focus of its research program to applied studies and research. *Page 45*

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### Cost Issues

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#### Finding 1

The projected costs of compliance are escalating.

Recommendation: Caltrans should continue to explore ways to incorporate better estimating techniques into the construction planning process. Caltrans should continue to develop the most economical means of meeting the storm water compliance requirements. *Page 49*

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#### Finding 2

Storm water compliance costs are integrated into many of Caltrans' business processes and are not accurately tracked. Recommendation: Caltrans should develop tools and practices that accurately account for the costs of storm water compliance. *Page 51*

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#### Finding 3

As storm water compliance costs increase, the amount of funding available for highway projects decreases, which reduces the number of projects that can be constructed.

Recommendation: Caltrans should make clear to all parties involved that transportation funding is finite. To the extent that new and more accurate estimating and accounting are developed, transportation project budgets should also be modified to include the more accurate figures of storm water compliance costs. In addition, the storm water line item found in the State Highway Operations and Protection Program of the STIP Fund Estimate should include a description of the types of projects to be funded. Specifically, the line item description should note that the projects included are water quality only projects, which do not include projects with transportation improvement benefits, and do not include storm water costs associated with transportation projects. *Page 53*

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# **Caltrans' Response Letter to Finance Review**


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# Memorandum

*Flex your power!  
Be energy efficient!*

To: STEVE PEACE  
Director  
Department of Finance

Date: October 29, 2003

From: JEFF MORALES   
Director

Subject: Response to Department of Finance Report: *A Review of the Department of Transportation's Storm Water Management Program*

Thank you for the opportunity to review and comment on the Department of Finance's Performance Review of the California Department of Transportation's (Department) Storm Water Management Program. We appreciate your staff's considerable and professional efforts to research and prepare the Review, and welcome their findings, which I believe supports what the Department is doing within our Statewide National Pollutant Discharge Elimination System Permit.

The Department's specific responses to the Review's 14 findings are contained in the attached document. However, I invite you and any reader of this Review to look beyond the details of the Report's recommendations and our responses and explore the broader issues in storm water quality, the impacts of which extend to all municipalities and transportation agencies in the State. This Review is an excellent starting point from which to launch such an examination.

If you have any questions, please call Mark Rayback, Chief Environmental Engineer, at (916) 653-4446.

Attachment

STEVE PEACE  
October 29, 2003  
Page 2

c: Tony Harris  
Brent Felker  
Gary Winters  
Mark Rayback

Mark Rayback / hjt / DOF Report Storm Water Management Program



STEVE PEACE  
October 29, 2003  
Page 3

bc: Director's file  
Env. file - Storm Water

Mark Rayback / hjt / DOF Report Storm Water Management Program

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**Department of Transportation**  
**Response to Department of Finance Report: *A Review***  
***of the Department of Transportation's Storm Water***  
***Management Program***  
**October 2003**

Text for Findings and Recommendations is from the Department of Finance (DOF). Text for the Response sections is from the California Department of Transportation (Department).

**Finding 1**

Caltrans must comply with the storm water requirements set forth in its statewide NPDES permit, which is regulated by the State and regional boards. Implementation of storm water requirements also cross the jurisdiction of numerous agencies including the Army Corps of Engineers, Coastal Commission, Department of Fish and Game, and others, requiring Caltrans to comply with their requirements as well.

**Recommendations:** Caltrans should continue to strive for consistency in the implementation of storm water requirements across all districts. Caltrans should also evaluate the requirements of other agencies to determine if those requirements conflict with its permit. If a conflict exists, Caltrans should attempt to resolve the conflicting requirements.

**Response:**

The Department has ensured consistency in its processes relative to Storm Water by preparing standardized guidance and training to all staff involved in the application of Storm Water requirements. However, the Department has had difficulty in getting consistent direction and interpretation from regulatory agencies. This is an issue that is not unique to the Department, as other Storm Water permittees have also encountered similar problems. As an example, the Department is considered a “point-source” discharger, however, we are often times, also requested, as a condition of a needed permit, to comply with “non-point source” Storm Water requirements. In many instances, these two sets of requirements are contradictory. The Department has begun an effort to provide an overview of its Storm Water Program to regulatory agencies in an effort to gain a better understanding from all parties. The Department would like to work with the State Water Resources Control Board (SWRCB) to develop clarification on the jurisdictional authorities of the various regulatory agencies (Regional Water Quality Control Boards, California Coastal Commission, etc.).

**Finding 2**

Although Caltrans has a statewide permit, it is regulated by the nine regional boards and must comply with their requirements.

**Recommendation:** Caltrans should explore the possibility that they be regulated at the State Board level versus the nine regional boards.

**Response:**

The Department would like to explore this recommendation with the SWRCB and DOF.

**Finding 3**

In some instances, Caltrans has very little latitude on how to implement pollution control technologies. These limitations are primarily the result of litigation and court rulings.

**Recommendation:** Caltrans should continue to monitor relevant court actions and develop an overall litigation strategy to defend the department against future lawsuits including increased coordination with other permittees, where appropriate. In addition, Caltrans should continue to focus on complying with its permit and implementing its management plan.

**Response:**

As referenced in the Review, the Department has been operating under the provisions of a permanent injunction in District 7 and a consent decree in District 11 for a number of years. The Department has met all obligations under these lawsuits and is actively seeking to dissolve both. As was also referenced in the Review, there have been numerous other legal actions by other entities regarding the cost and benefits of Storm Water treatment, the definition of “maximum extent practicable” (MEP), and other storm water regulations. The Department will continue to monitor relevant litigation, regulations, and legislation, and take a more proactive role in all.

**Finding 4**

There were relatively few enforcement actions for a program as large in scope and breadth as Caltrans Storm Water Management Program, but the actions are not well tracked as evidenced by the discrepancy in the number of actions recorded by the State Board and Caltrans.

**Recommendation:** Caltrans should develop a means to document and track enforcement actions on a timely basis.

**Response:**

Due to the low volume of enforcement actions, the Department did not establish a formal tracking mechanism. The Department relied on a more informal, lessons-learned approach within each District, as the enforcement actions were perceived as isolated issues and not indications of systemic problems. These actions will be tracked in the future as part of the Program's shared database, the Caltrans Annual Report System (CARS) that was implemented in September 2003.

**Finding 5**

The USEPA Region 9 commissioned a program evaluation of Caltrans District 5 (Central Coast) Storm Water Management Program to determine the level of compliance with the provisions of the NPDES Permit and the storm water management plan. The evaluation found only minor deficiencies. However, the State Board does not agree that a lack of measurable goals within Caltrans' management plan is a minor deficiency, and will be notifying Caltrans of such.

**Recommendation:** No additional action is necessary in that Caltrans has begun to implement the appropriate corrective actions.

**Response:**

None.

**Finding 6**

Caltrans is having mixed success in trying to ensure statewide consistency in the interpretation and application of the statewide permit requirements.

**Recommendation:** Caltrans needs to recognize a stronger role for its Headquarters whose responsibility it is to ensure statewide consistency. Caltrans should continue working with the State and regional boards to improve communication and coordination.

**Response:**

In 2001, the Department obtained DOF approval to create a Chief Environmental Engineer at the Principal Transportation Engineer level to serve as the Department's single focal point for all Storm Water issues. This position was filled in March 2002. This person reports directly to the Chief, Division of Environmental Analysis, and has been delegated full authority over all Storm

Water resources, and serves as the Department's official point of contact for all Storm Water issues. The Department will continue to support full execution of the position's purpose and role.

#### **Finding 7**

The organizational structure of the program varies from district to district, and is different from the program structure described in the storm water management plan.

**Recommendation:** Caltrans should modify the information in the storm water management plan to reflect the correct organizational structure or Caltrans should organize the Storm water Management Program consistent with the storm water management plan.

#### **Response:**

As mentioned in the response to Finding 6 above, the Department has recently established a new Storm Water Program Manager. As a result of this appointment, and other organization changes in Districts, the Storm Water Management Plan (SWMP) will be modified. The Department will submit a revised SWMP to the SWRCB in January 2004 as part of the Department's Permit renewal.

#### **Finding 8**

Some staff appear to resist the required changes to Caltrans' project delivery processes that are necessary to bring the department into compliance with the statewide permit. This resistance appears to be due to a lack of knowledge on the program requirements.

**Recommendation:** Caltrans should continue its increased level of training to insure that program staff is sufficiently aware and knowledgeable about the program requirements. In addition, Caltrans needs to improve its tracking of individuals trained as well as the subject matters in which staff are receiving training.

#### **Response:**

The Department plans to continue its aggressive Storm Water training program. However, limitations on the Department's budgetary situation could influence the amount of training that is delivered. Administrative processes for Storm Water specific classes have recently been modified to mirror the normal Department

protocols. This will ensure that training classes and participants are adequately tracked.

In addition, the Department will better coordinate training on Storm Water, so that all courses tie back to a general class that provides a fundamental understanding of storm water issues, the National Pollutant Discharge Elimination System (NPDES) Permit, the SWMP, and the Storm Water organization (i.e. focal point, coordinators, etc.). This class will serve as an introduction for all employees and a prerequisite for all other Storm Water classes.

### **Finding 9**

Caltrans has made a concerted effort to integrate storm water requirements into the planning and design of projects.

**Recommendation:** Continue to update storm water requirements and incorporate them into the planning and design of projects.

### **Response:**

The Department will strive for continuous improvement on all of our business practices. The Department recently released the Project Planning and Design Guidance for Storm Water and has been conducting training on it for the past six months. Training will continue as the Permit changes and procedures are refined. Furthermore, the Department anticipates releasing the Storm Water Quality Assessment Guidance in winter 2004, which will specifically describe how Storm Water issues are to be addressed in projects during the environmental phase of project development.

### **Finding 10**

Caltrans has implemented new data collection requirements to assist the department in documenting how each best management practice is selected for incorporation into each project design.

**Recommendation:** Caltrans should evaluate the new data collection requirements after a reasonable period of time to insure that information collected is accurate and of value.

### **Response:**

The Department will strive for continuous improvement in all of our business practices. For example, the new CARS data base (as described under Finding 4) facilitates collection and analysis of Storm Water information.

**Finding 11**

An overall lack of knowledge of storm water constituents, as well as requirements of court orders, has driven Caltrans' need to spend significant amounts of money on general research efforts, instead of focusing on applied research specific to Caltrans' immediate needs.

**Recommendation:** Now that Caltrans has acquired a significant amount of knowledge about the constituents found in storm water, Caltrans should change the focus of its research program to applied studies and research.

**Response:**

As part of the NPDES Permit, SWMP and litigation, the Department was required to undertake a significant effort in general research. This effort was to investigate and identify pollutants contained in runoff from Department facilities, gain understanding of impacts to receiving waters, and research potential treatment alternatives. This three-year program is now complete. With a firmer understanding of specific constituents of concern and their potential impacts, the Department plans to focus efforts on the continued development and refinement of Storm Water best management practices (BMPs) and reduce the amount and extent of characterization monitoring. However, should the next NPDES Permit dictate further research or monitoring, then development and refinement of BMPs would this focus will be impacted. Furthermore, limitations on the Department's budgetary situation could affect the amount of research that can be conducted.



### **Cost Finding 1**

The projected costs of compliance are escalating.

**Recommendation:** Caltrans should continue to explore ways to incorporate better estimating techniques into the construction planning process. Caltrans should continue to develop the most economical means of meeting the storm water compliance requirements.

#### **Response:**

The Department's standard estimating tools and processes require historical data to better estimate costs. Because Storm Water treatment devices are relatively new, that comprehensive data set is not yet available. As the data set expands, so will the accuracy of the estimates.

### **Cost Finding 2**

Storm water compliance costs are integrated into many of Caltrans' business processes and are not accurately tracked.

**Recommendation:** Caltrans should develop tools and practices that accurately account for the costs of storm water compliance.

#### **Response:**

The Department attempts to project compliance costs as accurately as possible. However, as stated in numerous places within the Review, "compliance" itself is difficult to define. For example, the Review discusses the lack of definition of MEP, or the ambiguity of meeting water quality standards versus meeting MEP. Until there is a widely understood definition of "compliance", the Department will be forced to operate at some level of uncertainty and risk. Operating with uncertainty and with significant risk requires contingencies in the form of additional resources and staff effort.

### **Cost Finding 3**

As storm water compliance costs increase, the amount of funding available for highway projects decreases, which reduces the number of projects that can be constructed.

**Recommendation:** Caltrans should make clear to all parties involved that transportation funding is finite. To the extent that new and more accurate estimating and accounting are developed, transportation project budgets should also be modified to include the more accurate figures of storm water compliance

costs. In addition, the storm water line item found in the State Highway Operations and Protection Program of the STIP Fund Estimate should include a description of the types of projects to be funded. Specifically, the line item description should note that the projects included are water quality only projects, which do not include projects with transportation improvement benefits, and do not include storm water costs associated with transportation projects.

**Response:**

The Department can provide information to regulatory bodies on the fiscal/transportation impact of permit compliance. However, these agencies do not generally have to consider what costs their actions cause for permittees. At this point, there is no mechanism to balance transportation needs with storm water requirements.

As stated previously, the Department continuously updates its estimating tools for capital costs and support costs. As these methodologies are refined with more data, estimates will improve. However, as was also mentioned, until “compliance” is truly defined, all costs will require a contingency element for storm water.

The Department will make efforts to clarify the purpose and scope of projects included in the Storm Water portion (“335 element”) of the State Highway Operations and Protection Program (SHOPP). The “335 element” contains only those projects whose purpose is solely for Storm Water reasons. These “335” projects do not have a transportation benefit, e.g., they do not involve traffic safety, highway preservation or facilities as do other SHOPP projects. The Department will work with California Transportation Commission to adjust the text of the STIP Fund Estimate to more clearly show the true nature of the “335” projects.

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# Appendices

## Appendix A — Definition of Terms and Acronyms

<b>ASBS</b>	Areas of Special Biological Significance—34 locations along the California coast and offshore islands that the State Board has officially designated as having unique biological value and/or fragility.
<b>Basin Plan</b>	A water quality control plan developed by a regional board for a specific geographic area. The plan identifies beneficial uses of waters (which includes a system of river(s) and tributaries), the water quality objectives needed to maintain these beneficial uses, and an implementation plan.
<b>BAT/BCT</b>	Best Available Technology Economically Achievable/Best Conventional Technology—Standard of pollutant discharges that must be met for Construction General Permit requirements. However, measures that are more stringent must be adopted, if necessary, to meet water quality standards. The BAT standard is for toxic pollutants; the BCT standard is for conventional pollutants. (See maximum extent practicable.)
<b>Beneficial Uses</b>	The resources, services, and qualities of state waters that may be protected against quality degradation.
<b>BMP</b>	Best Management Practices—Practices, whether actual or managerial, that when implemented reduce the discharge of pollutants.
<b>CWA</b>	Clean Water Act—(Federal Water Pollution Control Act) As amended in 1972, required regulation of point source discharges of pollutants into waterways via the NPDES program. The 1987 amendments [Sec. 402(p)] specified that storm water is point source discharge.
<b>FPPP</b>	Facility Pollution Prevention Program Plans—A plan that identifies the functional activities specific to the maintenance facility and the applicable BMPs and other procedures utilized by maintenance personnel to reduce the discharge of pollutants in storm water.
<b>IC/DC</b>	Illicit Connection/Illegal Discharge—Connections or discharges to storm sewer systems made by others without permission or a permit.
<b>Maximum Extent Practicable</b>	Maximum Extent Practicable—Standard of pollutant discharges that must be met for municipal separate storm sewer systems permit requirements. However, measures that are more stringent must be adopted if necessary to meet water quality standards. (See BAT/BCT)
<b>Municipal Separate Storm Sewer System</b>	Municipal Separate Storm Sewer System—means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned or operated by a state, city, town, borough, county, parish, district, association, or other public body.

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<b>Nonpoint Source Discharge</b>	A nonpoint source discharge is a discharge from a diffuse pollution source (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet).
<b>NPDES</b>	National Pollutant Discharge Elimination System—Implements the CWA by providing permits to discharge pollutants into regulated waterways.
<b>Permanent BMPs</b>	BMPs that are installed during construction and designed to provide long-term storm water quality protection.
<b>Point Source</b>	Any discernible, confined, and discrete conveyance or collection system by which pollutants are or may be discharged.
<b>SWMP</b>	Storm Water Management Plan— The management plan describes how the permittee will achieve the goal of reducing discharges of pollutants to the maximum extent practicable. Elements of the plan include a description of the best management practices that will be implemented to address specific program areas, the plan includes measurable goals, and timetables for the implementation of six minimum control measures.
<b>SWPPP</b>	Storm Water Pollution Prevention Plan—A plan that describes the construction best management practices the contractor is planning to use (may even include specifics such as the amount of material to be used) to reduce the discharge of pollutants in storm water at individual construction sites.
<b>State Board</b>	State Water Resources Control Board—California’s regulatory agency that implements and enforces the CWA and the Porter-Cologne Water Quality Control Act.
<b>Temporary Construction Site BMPs</b>	BMPs only temporarily required to address a short-term storm water contamination threat.
<b>TMDL</b>	Total Maximum Daily Load—Set by states under 303(d) of the CWA. Must be established for impaired water bodies. Must be set at levels to achieve the designated water quality standard, plus a margin of safety, taking into account seasonal variations and lack of knowledge regarding the relationship between effluent quantities and water quality. “A TMDL is a written, quantitative plan and analysis...” (40 CFR 130.32).
<b>USEPA</b>	United States Environmental Protection Agency—The federal agency with primary responsibility for implementation of federal environmental statutes, including the CWA.
<b>WQS</b>	Water Quality Standards—State-adopted and USEPA-approved ambient standards for water bodies. The standards prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses.

### Appendix B — Beneficial Use Codes

<b>AGR</b>	Agricultural Supply	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
<b>ALL</b>	All Beneficial Uses	All beneficial uses.
<b>AQUA</b>	Aquaculture	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
<b>BIOL</b>	Preservation of Biological Habitats	Uses of water that support designated areas or habitats, such as Areas of Special Biological Significance (ASBS), established refuges, parks, sanctuaries, ecological reserves, or other areas where the preservation or enhancement of natural resources required special protection.
<b>COLD</b>	Cold Freshwater Habitat	Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
<b>COMM</b>	Commercial and Sport Fishing	Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
<b>EST</b>	Estuarine Habitat	Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
<b>EWE</b>	Environmental Water Quality	Beneficial uses of waters that support natural enhancement or improvement of water quality in or downstream of a water body including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, stream bank stabilization, maintenance of channel integrity, and siltation control.
<b>FLD</b>	Flooding	Beneficial uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.
<b>FRSH</b>	Freshwater Replenishment	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under State or federal law as rare, threatened, or endangered.

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<b>GWR</b>	Ground Water Recharge	Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting salt-water intrusion into fresh water aquifers.
<b>IND</b>	Industrial Service Supply	Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.
<b>MAR</b>	Marine Habitat	Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shore birds).
<b>MIGR</b>	Migration of Aquatic Organisms	Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
<b>MUN</b>	Municipal and Domestic Supply	Uses of water for community, military or individual water supply systems including, but not limited to, drinking water supply.
<b>NAV</b>	Navigation	Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
<b>NONE</b>		No designated beneficial uses.
<b>POW</b>	Hydropower Generation	Uses of water for hydropower generation.
<b>PROC</b>	Industrial Process Supply	Uses of water for industrial activities that depend primarily on water quality.
<b>RARE</b>	Rare, Threatened, or Endangered Species	Preservation of rare, threatened, or endangered species.
<b>REC1</b>	Water Contact Recreation	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
<b>REC2</b>	Non-Contact Water Recreation	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, or beachcombing.

## A Review of the Department of Transportation's Storm Water Management Program

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### Appendix B, continued

<b>SAL</b>	Inland Saline Water Habitat	Uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.
<b>SHELL</b>	Shellfish Harvesting	Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.
<b>SPWN</b>	Spawning, Reproduction, and/or Early Development	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
<b>WARM</b>	Warm Freshwater Habitat	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
<b>WET</b>	Wetland Habitat	Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.
<b>WILD</b>	Wildlife Habitat	Uses of water that support terrestrial ecosystems including, but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.



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## Appendix C — Storm Water Pollution Prevention Plans

A Storm Water Pollution Prevention Plan for general industrial permittees and general construction permittees has the following requirements:

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**TABLE 8**

### Storm Water Pollution Prevention Plan (SWPPP) Elements

Industrial Activities Permit 41	Construction Activities Permit 42
Storm Water Pollution Prevention Team	Identification of potential sources likely to add significant quantities of pollutants
Review of other regulatory requirements and existing facility plans applicable to storm water	Identification of potential sources of non-storm water discharges
Site map including industrial activity areas	Site map and estimates of size of construction site
Identification of non-storm water discharges	A list of pollutants likely to be present
Identification and assessment of potential pollutant sources	Erosion and sediment controls
Inventory of materials at the site	Practices to eliminate or reduce to the extent feasible any discharges of material other than storm water
Best management practices to reduce or prevent each identified pollutant	Provisions ensuring that wastes are disposed of at the site
Employee training requirements	Proposed post-construction controls
Record keeping and annual reporting provisions	Maintenance, inspection, and repair procedures
Annual inspection and evaluation provisions	Training for personnel who perform inspections
Signature and title of the person responsible for preparing the SWPPP	List of all contractor and subcontractors responsible for implementing the SWPPP
	Incorporation by reference of appropriate elements of other plans
	Signature and title of the person responsible for preparing the SWPPP

### **Appendix D — Overview of Caltrans' Storm Water Management Plan**

As required by the Statewide National Pollutant Discharge Elimination System Storm Water Permit (Permit) issued to Caltrans by the State Board on July 15, 1999, Caltrans must submit an annual Storm Water Management Plan (storm water management plan) to the State Board for its approval. According to Caltrans' officials, the storm water management plan, which was finally approved in August 2001, reflects the Permit that was primarily prepared by the State Board. However, according to State Board officials, Caltrans provided a number of drafts to the State Board that were not acceptable. The State Board staff made edits to Caltrans' proposed management plan, but Caltrans' staff prepared the majority of the document. The edits were reviewed, negotiated, and revised until consensus between Caltrans and the State Board was reached.

Caltrans submitted a revised storm water management plan in April 2002 for approval by the State Board that was approved with five unresolved changes on February 13, 2003. Even though the 2002-storm water management plan was approved in February 2003, Caltrans submitted the 2003 storm water management plan as required in April 2003. The permit will be up for renewal in 2004 and Caltrans with the assistance of a contractor is in the process of rewriting it. Caltrans' officials stated that substantial changes to the storm water management plan subject to the approval of the State Board and Permit could be expected.

Regional boards enforce the Permit. Caltrans also submits, on an annual basis as part of the Annual Report, Regional Work Plans to the regional boards. The Regional Work Plans, approved by the Regional Water Quality Control Boards, describe the activities to be conducted by Caltrans to implement the storm water management plan during the upcoming reporting period.

Caltrans must review and evaluate its storm water management plan annually and update it as part of the Annual Reporting process outlined in the Permit to the State Board. The storm water management plan describes the minimum procedures and practices Caltrans will employ to meet the requirements of the Permit. The storm water management plan does not and was not designed to provide the detailed guidance and requirements needed to direct the activities of Caltrans personnel. Specific guidance can be found in various documents, manuals and standards, and specifications. The storm water management plan provides an overview of the program with specific emphasis on best management

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practices. The storm water management plan is organized into the following ten sections and three appendixes:

- **Section 1:** Overview of Storm Water Management Plan
- **Section 2:** Program Management
- **Section 3:** Best Management Practice Identification and Implementation
- **Section 4:** Project Development Storm Water Management Program
- **Section 5:** Maintenance Storm Water Management Program
- **Section 6:** Training and Public Education Program
- **Section 7:** Monitoring and Research Program
- **Section 8:** Program Evaluation
- **Section 9:** Reporting
- **Section 10:** Location-Specific Requirements
- **Appendix A:** Descriptions of Individual Districts
- **Appendix B:** Best Management Practice Evaluation and Approval Process
- **Appendix C:** Abbreviations, Acronyms, and Definitions of Terms

The sections below summarize the information presented in the storm water management plan.

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## **Program Management**

### **Headquarters**

Headquarters personnel have responsibility for program and policy development, oversight, monitoring, and reporting whereas district personnel have day-to-day responsibility for implementing the program. The Director issues general directives that are relayed to the Deputy Directors and District Directors. The four Headquarters' functional programs (Construction, Design, Maintenance, Environmental) provide technical guidance, directives, and monitoring to the functional programs at the district level.

The Water Quality Program is responsible for managing the Storm Water Management Program and coordinates the implementation of the storm water management plan with the

districts and the Headquarters' functional programs. There are Storm Water Coordinators for all of the districts and for each functional program. The Coordinators facilitate implementation of the Storm Water Management Program and serve as the liaisons to the regional boards. In addition, there are four Storm Water Advisory Teams, one for each functional program, which evaluate new and improved best management practices and develop procedures and guidance for implementation of the storm water management plan.

### **Design Program**

At the district level, the Design Division Chiefs ensure compliance with all elements of the storm water management plan that are the responsibility of the District Design Division. The Project Engineer determines whether a Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Program (WPCP) is required for the project and that the appropriate permanent best management practices are included in the project. The Project Engineer also includes into the plans and specifications for projects any needed storm water permanent and treatment control practices.

Each District is responsible for submitting a Notification of Construction and a Notice of Completion to the appropriate regional board within the specified timeframe for projects that are required to have a SWPPP. The Construction Division or Project Development may assume these responsibilities. (Note: To comply with Phase II of the Clean Water Act, Caltrans requires a SWPPP for all projects where construction activities result in less than five acres but more than one acre of soil disturbance if the project is advertised after November 1, 2002 or if construction will continue beyond March 23, 2003.)

### **Construction Program**

At the district level, the Construction Division Chiefs ensure compliance with all elements of the storm water management plan that are the responsibility of the Construction Division. Each district has a Storm Water Coordinator that conducts inspections of construction sites to ensure that the appropriate storm water controls have been implemented. The Coordinator also assists the Resident Engineer (RE) by reviewing the adequacy of the SWPPPs or WPCPs. The RE is responsible for ensuring that storm water controls are implemented at the construction site regardless of whether Caltrans employees or contractors perform the work. The contractor is responsible for adhering to the plans and specifications including storm water requirements as outlined in the contract.

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## **Maintenance Program**

Because maintenance activities performed on the state highways may affect storm water and receiving water quality, the storm water management plan describes the responsibilities of the Headquarters' Maintenance Program and the District Maintenance Divisions. The Maintenance Program also is responsible for the management of potential storm water pollution from accidental spills, illicit connections, illegal discharges, and dumping within Caltrans right-of-way. At the District level, the Maintenance Division Chiefs ensure compliance with all elements of the storm water management plan that are the responsibility of the Maintenance Division. The Maintenance Managers supervise the Maintenance Superintendents that are responsible for implementing maintenance best management practices. The Maintenance Superintendents supervise the Maintenance Supervisors who directly supervise the maintenance crews responsible for the actual best management practice implementation.

**BMP Identification and Implementation** Best management practices are operational activities or physical controls that are “designed to reduce the discharge of pollutants from the Caltrans storm drain system to the maximum extent practicable, and to control the discharge of pollutants from regulated construction projects by employing “best conventional technology” (BCT) and “best available technology” (BAT). Caltrans has three categories of best management practices: Maintenance, Construction, and Treatment. The selection of best management practices for a specific condition at a construction site, section of roadway, or maintenance facility are described in the Guidelines. The selection of specific best management practices begins during the planning and scoping of an activity and is an iterative process. Once a project has a detailed design, the best management practice selection process is revisited and any adjustments are made. When a project is completed, Maintenance is responsible for implementing maintenance best management practices.

In the storm water management plan, Caltrans has provided a detailed list of approved best management practices for Caltrans personnel to “draw upon when making implementation plans and decisions at a District-specific or site-specific level.” The list is referred to as a “best management practice toolbox.” The toolbox provides a list of best management practices that could be deployed for specific conditions that exist at a site.

### **Design Pollution Prevention BMPs**

Caltrans considers Design Pollution Prevention best management practices during the planning and design process for all new facilities and reconstruction or expansion of existing facilities. These best management practices are incorporated as appropriate and are standard technology-based, non-treatment controls that reduce pollutant discharge to the maximum extent practicable. Including Design Pollution Prevention best management practices into projects is an iterative process that incorporates more specific best management practices as a design becomes more detailed. Design Pollution Prevention best management practices include consideration of downstream effects, preservation of existing vegetation, concentrated flow conveyance systems (e.g., ditches, berms, overside drains, outlet protection, etc.), and slope/surface protection systems (i.e., vegetated surfaces, hard surfaces). The best management practices chosen are project specific and are revisited and revised as necessary as the project moves through the design process.

### **Maintenance BMPs**

Maintenance best management practices apply to ongoing maintenance of roadways and facilities. Caltrans implements maintenance best management practices to reduce discharge of pollutants caused by maintaining roadways and activities conducted at Caltrans owned or operated facilities. These best management practices can be technology-based and are designed to prevent pollution to the maximum extent practicable. The Maintenance Division interfaces with the Storm Water Management Program in three ways: 1) maintenance of treatment best management practices, 2) implementation of storm water best management practices at maintenance facilities, and 3) implementation of best management practices during highway maintenance activities. The six categories of maintenance best management practices include best management practices for cleaning, safer alternative products, protection of drainage plants, maintenance facility housekeeping practices, soil and liquid waste management, and performing work in dry weather.

The Maintenance Activities best management practice program was approved by the State Board on February 13, 2003, as part of the approved 2002 storm water management plan. The prior program was not accepted by the State Board and regional boards due to its lack of specificity and detail. Although overdue by more than a year, the Maintenance Best Management Practice Manual or Staff Guide was delivered to staff in mid-June 2003.

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To address best management practices for facilities, Caltrans has developed Facility Pollution Prevention Plans (FPPP) for each maintenance facility owned or operated by Caltrans. The activities conducted at the facilities and the best management practices implemented to reduce the discharge of pollutants are described in the FPPPs.

## Construction BMPs

Construction best management practices are temporary control practices that reduce storm water discharges and eliminate non-storm water discharges on construction sites. There are various best management practices for the following areas.

Temporary sediment control	Temporary soil stabilization	Scheduling
Preservation of existing vegetation	Temporary concentrated flow conveyance controls	Temporary stream crossing
Clear water diversion	Wind erosion control	Sediment tracking control
Waste management	Materials handling	Vehicle and equipment operations
Paving operations	Stockpile management	Water conservation practices
Potable water/irrigation	Dewatering operations	Illicit connections/illegal discharge
Storm drain inlet protection	Stabilized construction entrance/exit.	

Some construction best management practices may be called out in the project plans and Standard Specifications as well as the Provisions of the construction contract.<sup>43</sup> The Resident Engineer (RE) is responsible for ensuring that construction best management practices are implemented and maintained at the construction site. The contractor must submit to Caltrans for approval a SWPPP. The plan describes the construction best management practices the contractor is planning to use and may even include specifics such as the amount of material to be used.

## Treatment BMPs

Treatment best management practices are implemented for all new development, and not just for a storm drain systems that directly discharge to a surface water. These best management practices are implemented so that pollutants are captured and removed before the runoff leaves the site. Treatment best management practices will be considered in

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<sup>43</sup> This will be required for all plans and standard specifications and provisions for projects ready to list on or after October 1, 2003. It is currently a practice used in a few districts. This practice appears to reduce construction costs associated with change orders and provides additional information to assist contractors in preparing SWPPPs.

proposed new construction and reconstruction projects. If the Project Engineer determines that, the project is not exempt and treatment controls are required, the Project Engineer may choose from six<sup>44</sup> approved treatment best management practices. Each treatment best management practice is designed and approved to treat specific pollutants. If Caltrans determines that the approved treatment best management practices are not acceptable for a specific project, the appropriate regional board will be consulted and alternatives will be sought. If viable alternatives do not exist, the results will be documented in a report Caltrans submits to the regional board.

An infiltration basin is the only treatment best management practice that addresses all nine pollutants<sup>45</sup> of concern and is considered wherever site conditions<sup>46</sup> allow and the water quality volume exceeds a particular measurement. If a project warrants the implementation of an infiltration basin, Caltrans' policy is to purchase right-of-way regardless of cost. However, if an infiltration basin is not feasible and right-of-way is not being acquired for other reasons (e.g., widening), other treatment best management practices will be designed into the project only if it fits within the existing right-of-way. Implementation of treatment best management practices can be costly. Caltrans has implemented a number of treatment best management practices that have been improved and others that are undergoing testing. The costs of the treatment best management practices vary by type, but can be very expensive. Once construction is completed, maintenance of the treatment best management practices are turned over to the Maintenance Division.

### **BMP Adoption Procedures**

Caltrans has established three steps in the best management practice approval process: 1) research; 2) evaluation; and 3) approval. The storm water advisory teams evaluate potential new best management practices using the criteria appropriate for the best management practice category. The storm water advisory teams are responsible for recommending that best management practices be approved, proposed for field innovation, additional research be conducted, or rejected. Re-evaluation and improvement of existing best management practices is primarily the responsibility of the storm water advisory teams.

The best management practices selected for evaluation are culled from the New Technology Report, a report that consolidates information about the practices and research

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<sup>44</sup> The six treatment BMPs are: Biofiltration Systems, Infiltration Basin, Detention Devices, Dry Weather Flow Diversions, Gross Solids Removal Devices, and Traction Sand Traps. Dry Weather Flow Diversions are used to treat nonstorm water flows only.

<sup>45</sup> <sup>46</sup> The nine pollutants are: total suspended solids, nutrients, pesticides, particulate metals, dissolved metals, pathogens, litter, biochemical oxygen demand, and total dissolved solids.

<sup>47</sup> Implementation of infiltration basins requires sufficient soil permeability, a sufficiently low water table, no threat to local groundwater quality, and allows for appropriate maintenance activities to occur.



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of others. In addition, the Monitoring and Research Program identifies opportunities for improvement with currently employed best management practices. If necessary, the Monitoring and Research Program will assist the storm water advisory teams by providing technical reviews of the best management practices. If the storm water advisory teams determine that a best management practice may potentially be acceptable, but the team is unwilling to approve it, the best management practice will be referred to research. The best management practices are tested in either a pilot program or other means before the storm water advisory teams recommending acceptance. The responsibility to approve best management practices is that of the Headquarters' Program Managers from Design, Construction, Maintenance, and Water Quality.

### **Employee Training Program and Public Education**

Caltrans trains both current and new employees on water quality issues, if appropriate. Caltrans has identified specific groups of employees that are required to be knowledgeable about storm water policies and practices to effectively perform their jobs. In addition, the Water Quality Program has developed specific storm water training courses that review storm water pollution prevention concepts and practices. After an employee has received the initial training, he/she must take a refresher course every four years. Caltrans plans on training one fourth of the employees in need of a refresher every year. Caltrans evaluates its training program on a yearly basis, and reports on its effectiveness and provides recommendations for revisions in the Annual Report submitted to the State Board.

In addition to the information Caltrans provides to contractors on their responsibilities, information on the problems and causes of storm water pollution is provided. The storm water management plan calls for Caltrans to provide information to contractors during three information exchange meetings: Pre-Bid, Pre-Construction, and ad hoc sessions on an as needed basis.

### **Public Education**

Caltrans has an outreach program that attempts to educate the public about storm water through a variety of written material, a website, workshops, and the Adopt-a-Highway Program. Caltrans also has installed anti-litter signs on highways and freeways and stenciled warnings prohibiting discharges to drain inlets on State-owned property.

Caltrans' plan to educate the public includes a research study on litter in the Fresno metropolitan area. Baseline data were collected in 2000-01 and 2001-02 and methods

for implementation and implementation of the education program, which began in fiscal year 2001-02 were completed in June 2003. To determine the success of the public education program, Caltrans planned on directly measuring the reduction of litter at predetermined sites and to survey the public. However, the amount of litter collected was too small to allow for a statistically valid analysis. Therefore, Caltrans was only able to survey the public to determine if the public education program had changed the public's behavior. Caltrans found that the public education program was successful in raising the level of awareness of litter as a problem.

### **Monitoring and Research**

The Monitoring and Research Program provides the Department with information about discharges resulting from Caltrans' operations, pollutants of concern, and the performance of storm water controls. The Program performs the following tasks: monitoring; modeling; watershed planning; litter management; erosion control; treatment study; and research program management. Each task has an assigned team, which conducts the required work, and may include university researchers, expert consultants, representatives of other storm water agencies, and environmental interest groups. The Monitoring Team oversees activities focused on understanding the characteristics of storm water runoff from highways, maintenance yards, park and ride lots, rest areas, construction sites, and other discharges. The Modeling Team manages and uses water quality data to produce flow and pollutant loading estimates and produces software tools that addresses permit obligations, and incorporates water quality considerations into various steps of the planning process. The Watershed Planning Team assists districts in its watershed planning efforts. The Litter Management Team field-tests and evaluates litter management practices. The Erosion Control Team evaluates the effectiveness of existing erosion control measures and investigates techniques that could improve vegetation. The Treatment Study Team is made up of two teams: the Pilot Study Team and the New Concepts Team. The Pilot Study Team initiates and manages special best management practice pilot studies while the New Concepts Team identifies potential innovative treatment best management practices. The Research Management Team oversees the preparation of the 3-Year Action Plan Report, the Summary of Activities Report, and the New Technology Report. Several other reports also are mandatory and are prepared by the different teams (see Table 9 below for list of reports and responsible teams).

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**TABLE 9****Summary of Reports by Caltrans' Storm Water  
Monitoring and Research Program**

<b>Title of Report</b>	<b>Description of Report</b>	<b>Project Team Responsible for Preparation</b>
<b>Storm Water Monitoring Program Summary of Activities</b>	Presents results of past year monitoring efforts and study findings.	Research Program Management Team
<b>Storm Water Monitoring Program: Annual Data Report</b>	Presents results of past year monitoring efforts.	Modeling Team
<b>Storm Water Monitoring Program: Characterization Monitoring Plans</b>	Presents proposed monitoring activities for upcoming year.	Monitoring Team
<b>Storm Water Monitoring Program: 3-Year Action Plan</b>	Presents 3-year monitoring activities.	Research Program Management Team
<b>Water Quality Assessment Report</b>	Identifies discharges that are 1) toxic or 2) exceed the numerical effluent limitations in the Lake Tahoe Hydrologic Unit.	Modeling Team
<b>Load Assessment Report</b>	Presents results of load prediction model.	Modeling Team
<b>New Technology Report</b>	Presents assessments of new or innovative BMPs not currently used by Caltrans.	Research Program Management Team

**Program Evaluation**

Caltrans is required to develop appropriate program evaluation and assessment tools and to establish measurable goals for storm water management plan implementation. The evaluation and assessment tools and goals are to be used for the program evaluation and assessment conducted for the Annual Report. The day-to-day supervision of the District Division Chiefs is the primary mechanism for evaluating the program. The Chiefs ensure that Caltrans is complying with the storm water management plan. In addition, Headquarters program managers from Design, Construction, and Maintenance are to provide follow-up checks on a regular basis.

The Water Quality Program staff host meetings for the storm water advisory teams that identify key issues and review the progress of storm water management plan

implementation. The storm water advisory teams also hold individual meetings for its specific area (Design, Construction, Maintenance, Water Quality).

Caltrans conducts a self-audit each year mandated by the Permit. This requirement is met through the submission of the Annual Compliance Review Plans prepared by Construction and Maintenance. Each year, construction and maintenance sites are reviewed for overall effectiveness for storm water pollution prevention and compliance with the storm water management plan. Construction sites are inspected year round and the compliance status of the project is documented on a standardized form. Construction sites with major or critical deficiencies are re-inspected to ensure improvements have been made. Maintenance sites are inspected year round and the compliance status is documented on a standardized site inspection checklist. Maintenance sites with major or critical deficiencies are re-inspected to ensure improvements have been made.

Caltrans is in the process of developing a Design Compliance Monitoring Program. The Program will evaluate compliance of project planning and design activities with requirements of the Permit and storm water management plan, and identify activities that need improvement and training needs. Caltrans will implement a Project Planning and Design Checklist to assist in determining compliance with design pollution prevention and treatment best management practice requirements.

Caltrans evaluates the adequacy of communication between the various Storm Water Coordinators, districts, and Headquarters functional programs. In addition, the coordination between districts and the regional boards is evaluated. A report is prepared each year that summarizes the evaluations.

### **Reporting and Other Requirements**

The current Annual Report was published on April 1, 2003, and is available on Caltrans' website, in hardcopy, and CD. It describes the planning, design, construction, and maintenance measures implemented by Caltrans for the Storm Water Management Program.

Caltrans reported on 39 different requirements in the current Annual Report. As required by the Permit or storm water management plan, Caltrans provides the following and more as part of the Annual Report:

- Identification and characterization of non-storm water discharges
- Storm water management plan, revised as necessary
- Regional Work Plans

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- Best Management Practice Selection Report
  - New best management practice selection reported in the New Technologies Report (attached to Annual Report)
  - Municipal Coordination Plan
  - Analysis of the Adequacy of Legal Authority
  - Fiscal Analysis (in third and fifth years of permit period)
  - IC/ID Program Report
  - Public Education Program Progress Report
  - De-Icer Report for the Tahoe Basin (submitted six months earlier than required to provide data in more timely matter)
  - Alternative Highway Drainage Design Report
  - Year-end Performance Report on Construction Inspections
  - Storm Water Treatment Technology Research Status Report
  - Annual Research Summary Report
  - Annual Data Summary Report

The Annual Report also includes a summary of the permanent and treatment best management practices implemented for all new construction projects, major reconstruction projects, and high priority retrofit projects under way during the reporting period. In addition, Caltrans is required to report all instances of noncompliance to the appropriate regional board. Caltrans also must report any discharges in the Lake Tahoe Hydrologic Unit that exceed the applicable numerical effluent limitations.

### **Location Specific Requirements**

This section describes the location-specific requirements for Districts 3, 7, 9, 10, and 11. The requirements reflect special conditions due to geography, climate, terrain, local hydrology, sensitive receiving waters, regional board Basin Plan requirements, and/or specific types of facilities. The requirements in Districts 7 and 11 are the result of lawsuits and continuing negotiations with the court and plaintiffs. Districts 3, 9, and 10 have specific requirements because areas within the districts affect Lake Tahoe and are under the jurisdiction of the Lahontan Regional Water Quality Control Board.

## Appendix E—Summary of Enforcement Actions Received

(November 2001 through May 2003;  
Data provided by Caltrans)

TABLE 10

District	RWQCB	Enforcement Type	Date	Summary
3	Lahontan	ACL Complaint #6-01-71	11/28/01	Discharge of sediment laden water from drilling operations to the Truckee River. Discharges were from a construction site at Boca/Floriston on Interstate 80 in Nevada County. \$10K fine issued with ACL defining procedures and alternatives.
3	Lahontan	ACL Complaint #6-01-70	11/28/01	Discharge of waste earthen materials from the cleaning of a drill bit into the Truckee River. Discharges were from the Boca/Floriston Project on Interstate 80 in Nevada County. \$10K fine issued with ACL defining procedures and alternatives.
3	Lahontan	ACL Complaint #6-01-69	11/28/01	Discharge of sediment-laden water to the Truckee River. Discharges were from a construction site at Boca/Floriston on Interstate 80 in Nevada County that had failed to implement BMPs identified by a Caltrans Storm Water Task Force representative. The BMPs not implemented included the covering of soil stockpiles in the median. \$20K fine issued with ACL defining procedures and alternatives.
3	Lahontan	ACL Complaint #R-6-T 2002-0018	11/29/01	Discharge from the malfunction of a BMP used for dewatering drilling operation that allowed the discharge of sediment-laden water into the Truckee River. Discharges were from a construction site at Boca/Floriston on Interstate 80 in Nevada County. \$10K fine issued with ACL defining procedures and alternatives.
5	Central Coast	NOV	1/29/02	Inappropriate deployment or lack of deployment of BMPs for Stowell Road Improvement Project on Highway 101. Corrective actions needed for BMPs before follow-up inspection planned for Feb. 12 <sup>th</sup> .

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11	San Diego	NOV	2/1/02	NOV for blasting operations on the Coronado Bridge, in which four discharges were reported. The largest being 200-300 lbs of blast material being discharged to properties under the bridge and an equal amount into San Diego Bay. The blast material itself is inert like sand, but the paint that was being stripped is high in heavy metals.
7	Los Angeles	NOV	5/23/03	Discharge of saw cut waste at the Moorpark Maintenance Station. Contractor directed slurry to a stenciled inlet warning of no dumping. Contractor ignored Water Board staff and initial efforts of Caltrans staff request to cease activity. Caltrans shall implement programs to ensure that staff recognize deleterious activities and has the ability to immediately cease activity.
3	Lahontan	Unknown	5/28/02	Reaffirmation of previous NOV that resulted in \$20K fine.
3	Lahontan	ACL Complaint #R6-T-2002-0026	5/7/02	Discharges and threat of discharges resulting from the failure to properly winterize the projects prior to the onset of storm event and after the final grading prohibition, and continuing with grading after the prohibition deadline. Discharges were from a construction site at Boca/Floriston on Interstate 80 in Nevada County. Related to the withdrawal of previous complaint and settlement upon a compliance project.
3	Lahontan	NOV	6/27/02	Unauthorized soil disturbance from a construction project on lands owned by Dept. of Fish & Game and Sierra Pacific Power Company. The construction site was at Boca/Floriston on Interstate 80 in Nevada County.
3	Lahontan	NOV	7/1/02	Unauthorized soil disturbance from a construction project at Boca/Floriston on Interstate 80 in Nevada County. Variety of soil disturbance activities described after site inspection.
3	Lahontan	NOV	7/26/02	Lack of proper preclusion methods for deterring public contact with wastewater facilities at the Gold Run Roadside Rest Area. Required technical report be submitted to explain why preclusion methods were not adequately outfitted and identification of preclusion methods to be implemented.

## A Review of the Department of Transportation's Storm Water Management Program

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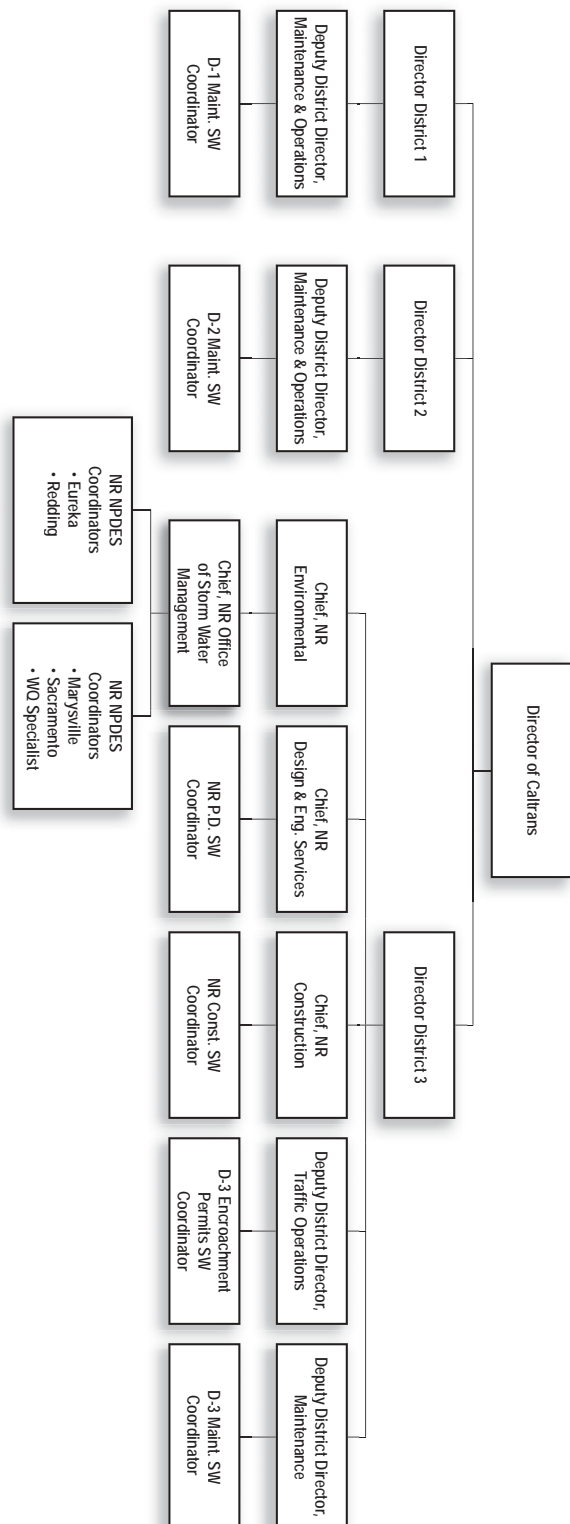
11	San Diego	NOV	8/12/02	NOV for the Kearny Mesa Maintenance facility. 14 violations were alleged. These violations were minor in nature and ranged from a dripping sink on a portable toilet that dripped water onto the parking lot, to stockpiles not being protected during the summer months, to "improper painting operations."
12	Santa Ana	NOV	11/1/02	NOV for construction SWPPP problems, as the contractor did not have a SWPPP that addressed BMP implementation for the site. Contractor failed to amend his SWPPP. Discharge to Delhi channel because of SWPPP not being followed.
11	San Diego	NOV	12/12/02	NOV for erosion problems on US Forest Service property. The NOV requested that Caltrans cooperate with the US Forest Service to correct the problem that is allegedly caused by cross culvert running under I-8. The land has admittedly been overgrazed and efforts to cooperate with the US Forest Service in the past have failed due to personnel changes at the Forest Service.
11	San Diego	NOV	12/20/02	NOV for the 5/805 widening project. 7 alleged violations were cited, associated with failure to amend SWPPP and failure to implement BMPs.
11	San Diego	NOV	1/8/03	NOV for an I-5 widening project. Failure to prevent prohibited discharges and failure to implement BMPs were cited as the reason for the NOV. Where sediment-laden water reportedly discharged from the site, no documentation or even an explanation was given after several requests. Lack of BMP implementation consisted of a slope that did not "implement an effective combination of sediment control and erosion control." The slope was in fact track walked and fiber roll was correctly installed on the slopes as shown in the photos the Regional board supplied in their NOV.
11	San Diego	2nd NOV	1/10/03	Received a second NOV for the 5/805 widening project. Failure to prevent prohibited discharges and failure to implement BMPs were referenced.
3	Lahontan	ACL Complaint #R6-T-2003-0005	1/29/03	Discharge of sediment-laden water. \$10K fine.
3	Lahontan	ACL Complaint #R6-T-2003-0006	1/29/03	Discharge of sediment-laden water. \$10K fine.

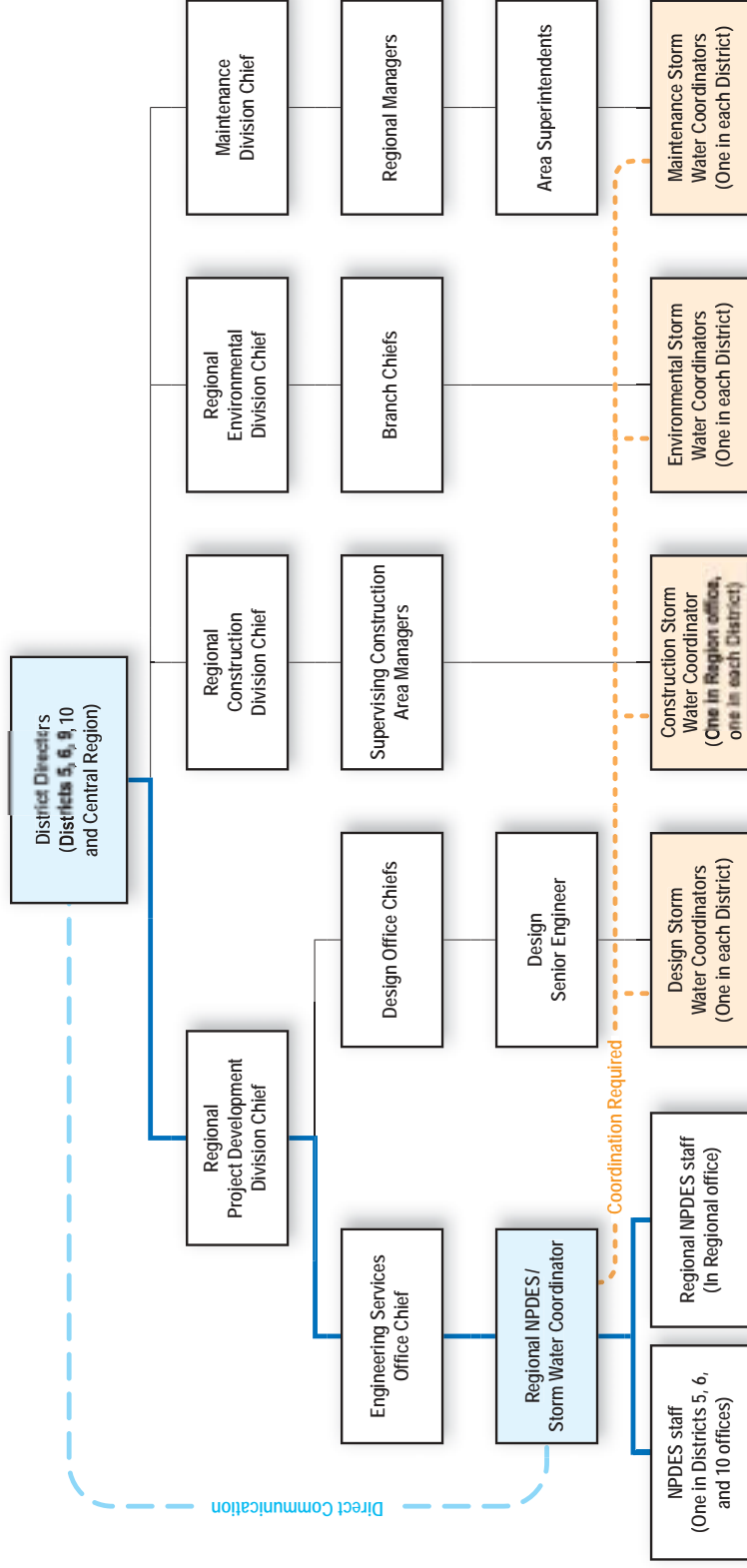


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3	Lahontan	ACL Complaint	1/29/03	Discharge of waste earthen materials from the release of 5 clamshell loads of sediment near the riverbank of the Truckee River. Release of material overwhelmed silt fence measure in place. Discharges were from the Boca/Floriston Project on Interstate 80 in Nevada County. \$5.5K fine issued with ACL defining procedures and alternatives.
3	Lahontan	NOV	2/6/03	Discharges of construction debris, wax emulsion, and concrete washings from a Construction site within the 100-year floodplain of the Truckee River. Trout Creek Bridge Replacement and Median Barrier Project was the site. Additional Action needed included the following: evidence of adequate supervision for ensuring proper controls are in place, documentation that the Water Pollution Control Manager has 24 hours of highway construction BMP training, and documentation that identified key project staff (Contractor and Caltrans) receive 4 hours of BMP training.
3	Lahontan	ACL Complaint	2/24/03	Follow-up on previous NOV's of 1/29/03 at Boca/Floriston Project that provides final (revised) penalties of \$10K, \$17.76K, and \$4.37K.
11	San Diego	NOV	3/3/03	Received third NOV for the 5/805 widening project. Failure to prevent prohibited discharges and failure to implement BMPs were referenced.

## Caltrans Regional Storm Water Organizational Chart—North Region



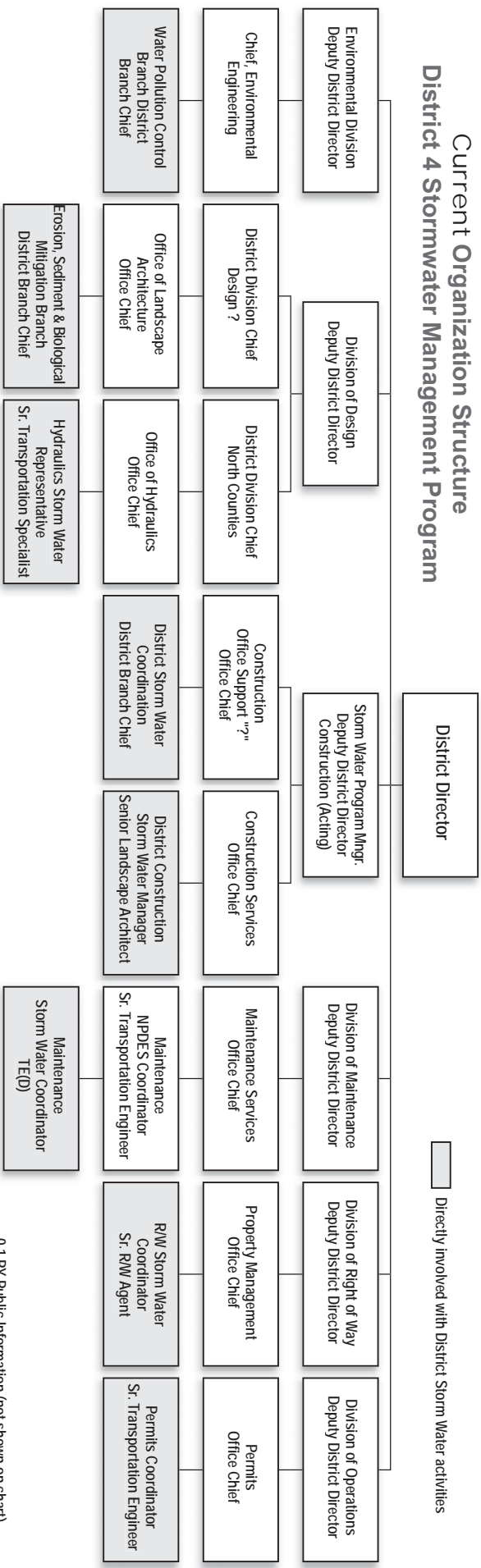


**Coordination Required** - - - - -

**Direct Communication** - - - - -

(Communication as required — Engineering Services Office Chief directly supervises Regional NPDES/Storm Water Coordinator.)

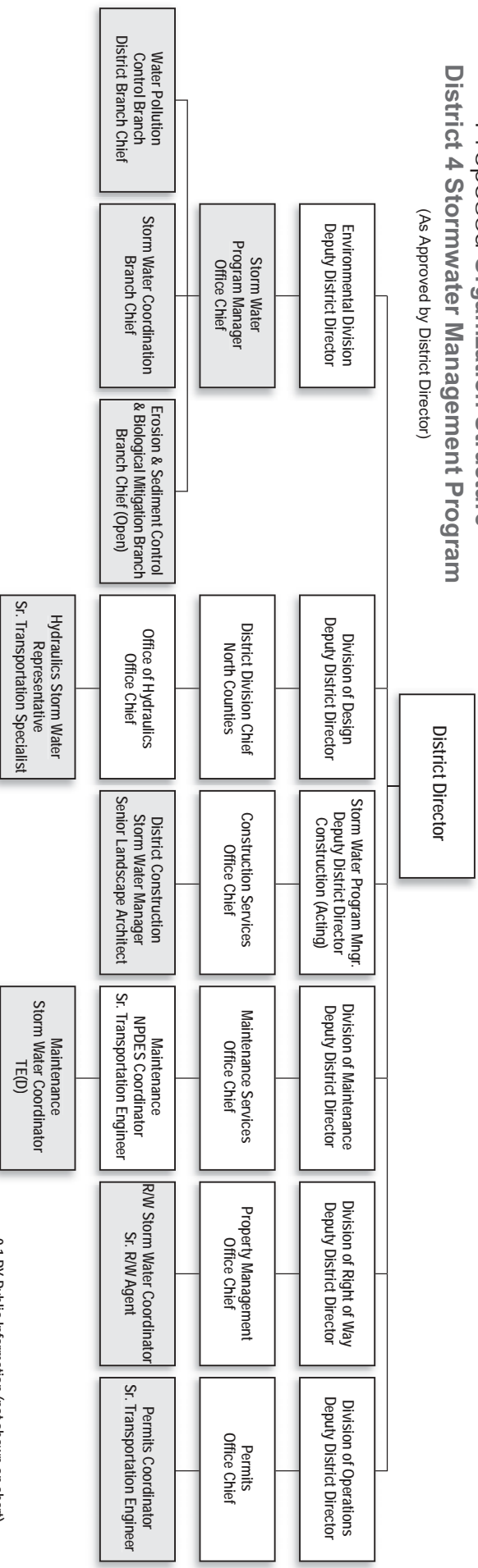
## Current Organization Structure District 4 Stormwater Management Program



0.1 PY Public Information (not shown on chart)  
PY (NPDES) — HQ allocations (7 PY's total)

## Proposed Organization Structure District 4 Stormwater Management Program

(As Approved by District Director)



1 Transportation Engineer

0.1 PY Public Information (not shown on chart)  
PY (NPDES) — HQ allocations (7 total)

Directly involved with District Storm Water activities

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## Appendix G — Research Projects

Statewide Runoff Characterization Studies-Monitoring and analysis of storm water runoff characteristics from Caltrans highways, maintenance yards, park-and-rides, rest areas, and construction sites.

- **First Flush Study** — Determining changes in storm water quality throughout storm events.
- **Litter Monitoring and Characterization** — Sampling and analysis to determine composition and amounts of litter in highway storm water runoff.
- **Toxicity Characterization** — Testing the toxicity of storm water runoff to correlate toxicity with chemical constituents.
- **California Toxics Rule (California Toxicity Rule) Characterization** — Developing protocols for detecting priority toxic pollutants in storm water.
- **Particle Size Studies** — Determining particle (sediment) size distributions in runoff and the correlation with pollutants.
- **Pathogen Characterization** — Determining the types and concentrations of disease-causing organisms from various sources.

The following group of subject matters was designed to provide alternative treatment methods and devices to determine the most practical and effective best management practices for Caltrans facilities:

- **Erosion Control** — Evaluating the most suitable methods for stabilizing roadside soil and sediment.
- **Vegetation Management** — Monitoring the fate and transport of herbicides (used to control roadside vegetation) in roadway runoff.
- **Structural (Treatment) Best Management Practice Pilot Research** — Testing a wide range of conventional storm water treatment devices (structural) at 36 sites.
- **New Storm Water Treatment Studies** — Developing new or modifying conventional systems for treating storm water while promoting efficiency at lower costs.

These research efforts were designed to aid in future watershed planning for reducing storm water pollution:

- **Storm Drain Outfall Inventory**— A statewide inventory of Caltrans storm drain outfalls with their drainage areas.
- **Water Quality Planning Tool**— An online tool providing water quality standards and estimated storm water runoff loads for Caltrans facilities.
- **Beneficial Use Values Database and Related Economic Studies**— Cost-benefit analyses of watershed best management practices from a database of economic values for beneficial water uses.
- **North Coast River Loading Study**— Pollutant loadings from Caltrans roadway runoff relative to pollutant contributions from other land uses within a watershed.
- **Small Stream Crossing Study**— The effects of storm water runoff from road crossings on small streams, focusing on two endangered species (coho salmon and steelhead trout).

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## Appendix H — Best Management Practices

Best management practices are operational activities and physical controls that are applied to storm water and other runoff to reduce pollution. Best management practices can be either structural or nonstructural controls that directly affect the release and transport or discharge of pollutants. There are essentially four types of best management practices: maintenance, design, construction, and treatment (see Table 11 below) that are employed for three types of activities: construction, maintenance, and water treatment (See Best Management Practice Section for description).

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**TABLE 11**

### **BMP Types and Responsible Program Area**

<b>BMP Description</b>	<b>Responsible Program Area</b>
Maintenance BMPs: litter pickup, toxics control, street sweeping, etc.	Maintenance Program
Design Pollution Prevention BMPs: permanent soil stabilization systems, etc.	Design Program
Construction Site BMPs: temporary runoff control on construction sites	Construction Program
Treatment BMPs: permanent treatment devices and facilities	Design, Construction, and Maintenance Programs

To fulfill permit requirements and to yield improved methods for reducing pollution, Caltrans studies numerous best management practices as part of its Monitoring and Research Program. Before a best management practice can be approved as a viable pollution control measure, Caltrans and the State Board must approve the best management practice. There are numerous steps in Caltrans' best management practice approval process (see Chart 3, BMP Approval Process). In essence, the process consists of three basic steps: 1) identification of best management practices; 2) evaluation of selected best management practices; and 3) approval of accepted best management practices.

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### **Identification of Potential BMPs Comes from Many Sources**

Potential best management practices or new technologies are identified through Caltrans' process of culling literature, acquiring information from consultants, manufacturers, regulators, third parties, and/or Caltrans personnel. In addition, information may be

obtained through Caltrans' formal New Product Review Process. This process allows manufacturers and/or suppliers to introduce products to Caltrans by contacting the New Product Coordinator.

After a potential best management practice is identified, and determined to have some merit, the Storm Water Treatment Technology Team prepares a fact sheet. A fact sheet presents summary information that Caltrans will use to evaluate the applicability of the new technology and determine if the new technology warrants the implementation of a pilot study.

The Storm Water Management Program requires Caltrans to issue an annual report that identifies potential best management practices not currently used by Caltrans on a statewide basis. The New Technology Report, which was most recently issued in February 2003, fulfills this requirement. New technologies are defined in the report as "the latest innovations in permanent storm water treatment and control, as well as existing technologies currently in use by municipal or other Department of Transportation storm water management programs but not previously selected (approved) as best management practices by Caltrans." The best management practices selected for evaluation are selected from the New Technology Report, a report that consolidates information about the practices and research of others. In addition, the Monitoring and Research Program identifies opportunities for improvement of the currently employed best management practices.

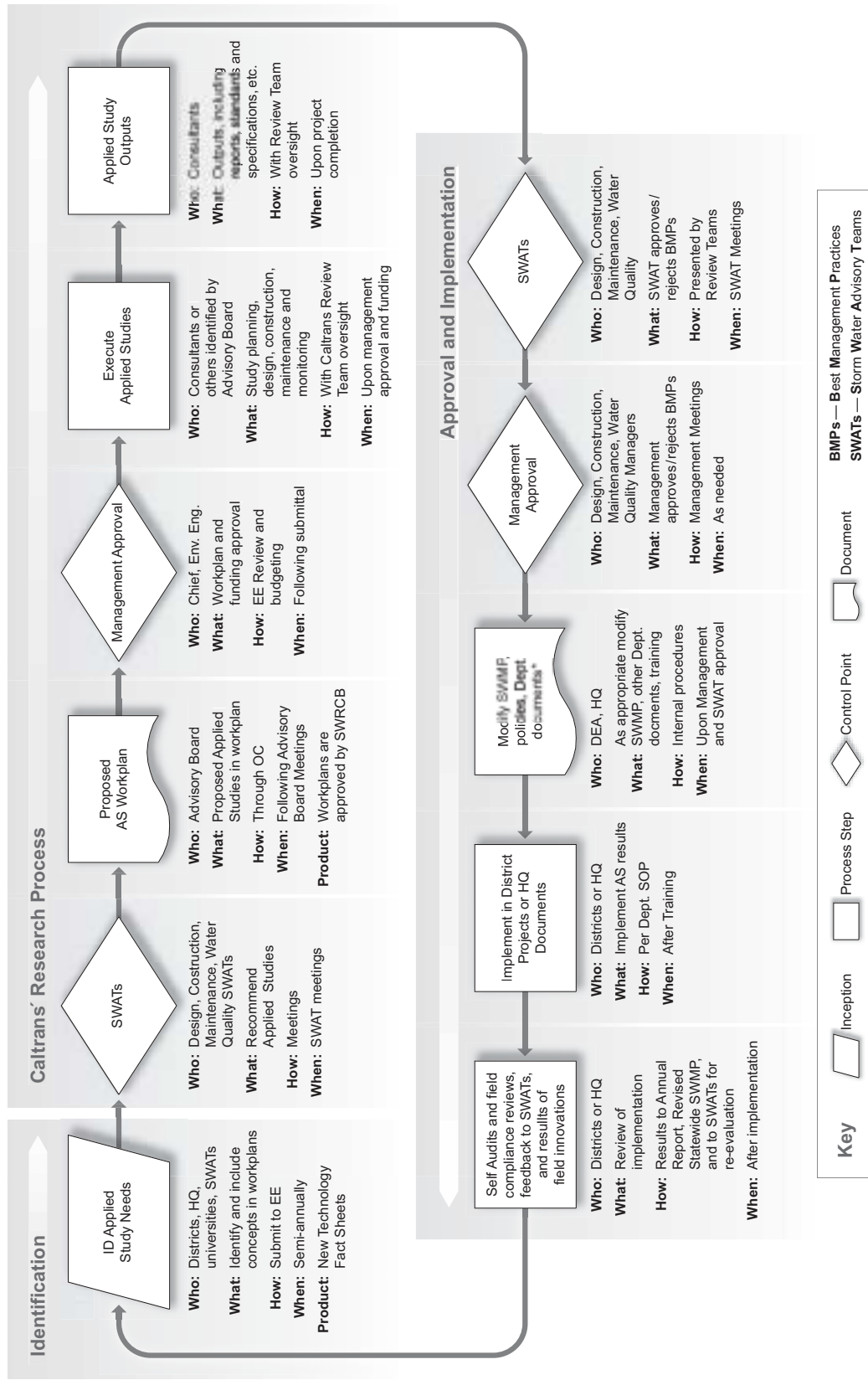
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### **Best Management Practices Are Evaluated Using Pilot or Reconnaissance Studies**

The Storm Water Advisory Teams are responsible for recommending that a proposed or revised best management practice within the storm water advisory teams assigned category (i.e., Design, Construction, Maintenance, Water Quality) be approved, proposed for implementation, withheld for further research, or rejected (see Table 12 for composition of storm water advisory teams). The storm water advisory teams evaluate potential new best management practices using the criteria appropriate for the best management practice category.



### Caltrans' Research Process



\* Workplans and SWMP approved by SWRCB

TABLE 12

### Composition of Storm Water Advisory Teams (SWATs)

SWAT	Members
<b>Maintenance</b>	District Maintenance Storm Water Coordinators, HQ: Maintenance, Water Quality, and Project Development Representatives
<b>Project Development (Design)</b>	District Design Representatives, HQ: Construction, other related units, Project Development, Water Quality, and Maintenance Representatives
<b>Construction</b>	District Construction Storm Water Coordinators and HQ Construction Representatives
<b>Water Quality</b>	District NPDES Storm Water Coordinators, District: Design, Construction, and Maintenance Representatives, and HQ: Project Development, Design, or Construction Representatives

The storm water advisory teams are responsible for recommending that best management practices be approved, proposed for field innovation, additional research be conducted, or rejected. Re-evaluation and improvement of existing best management practice is also the responsibility of the storm water advisory teams. The storm water advisory teams, utilizing the fact sheets, evaluate the proposed best management practice for relative effectiveness, technical feasibility, costs and benefits, and fiscal/legal feasibility. If the storm water advisory team determines that a proposed best management practice is promising, but not ready for implementation, it will be referred to research. The best management practices proposed for study by the storm water advisory teams are placed in the workplans. The workplans are submitted to Caltrans' management and the State Board for approval. If Caltrans' management approves the research study and funding is available, a research contract or interagency agreement is established or utilized. The best management practices then undergo reconnaissance and/or pilot testing. Before conducting a pilot study, a reconnaissance study, which provides more information than a fact sheet and may include preliminary cost estimates, may be conducted to determine if a pilot study is worthwhile. A reconnaissance study determines whether a technology is viable and will meet Caltrans deployment needs. The studies gather definitive performance data that are compiled and submitted to the storm water advisory teams for review.

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## **Storm Water Advisory Teams with Management Consent Approve Best Management Practices**

The Headquarters Program Managers from Design, Construction, Maintenance, and Water Quality have the responsibility for approving best management practices because the implementation of a best management practice can affect all of these programs. If a best management practice is approved by the storm water advisory teams and Caltrans' management for implementation, then the policies, procedures, and the storm water management plan are modified to include the approved best management practice. The storm water management plan is submitted to the State Board on an annual basis for approval. Caltrans produces a set of guidelines for each category of best management practice that includes conditions under which the best management practice should be implemented. In addition, standard plans and specifications may be developed or modified, training is conducted, operational procedures are developed, and departmental processes and documents are developed or modified to implement the new best management practice. The storm water advisory teams also re-evaluate existing approved best management practices. The re-evaluation is conducted using feedback from the Self-Audits, Field Compliance Reviews, and the Monitoring and Research Program. Once a best management practice is approved and placed in the storm water management plan, Caltrans personnel decide, within the specified guidelines, when and where the best management practice will be implemented.

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## **Research Reporting Requirements**

The SWTTT produces an annual report on the status of piloted technologies and reconnaissance studies conducted by Caltrans, which supplements the Annual Report and was most recently released in April 2003. The Storm Water Treatment Technology Research Status Report summarizes the permanent structural controls that treat storm water before it is discharged into the environment. Caltrans also produces the best management practice Selection Report, as required by the permit, which provides information on the results of the best management practice identification, evaluation, and approval process. The report is submitted on an annual basis as part of the storm water management plan.

In addition, Caltrans submits a Storm Water Monitoring & Research Program 3-Year Action Plan, which was most recently issued in March 2003. The action plan fulfills Caltrans' permit requirement to submit a "Monitoring Strategy Report Update." The report describes Caltrans' plan for conducting characterization studies, storm water treatment pilot studies, and erosion control and research.

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### **Costs of Best Management Practices Vary Significantly by Project**

The costs associated with implementing best management practices, whether design, construction, or treatment, vary greatly depending upon a number of factors. The geographical location of the project, the type of constituent to be treated, the time of year, size of the project, and other factors contribute to the significant difference in the cost of best management practice implementation for projects.

The costs are affected by: 1) the types of treatment best management practices chosen for implementation, and 2) whether right-of-way is acquired to implement the selected best management practice. Some projects may not require treatment best management practices because the projects do not directly or indirectly discharge into a surface water. The Project Engineer from the Division of Design would determine whether a project requires the implementation of treatment best management practices by referencing the decision tree located in the Project Planning and Design Guide. The types of constituents to be treated determine the types of treatment best management practices to be deployed. The costs for implementing different treatment best management practices vary. If the Project Engineer determines an infiltration basin is required, Caltrans will purchase right-of-way to implement the treatment best management practice. Projects that require the acquisition of right-of-way for implementation of treatment best management practices will have higher costs than those that do not purchase new right-of-way. If the project is located in an area of the state where the cost of purchasing right-of-way is high, the cost to implement the treatment best management practice could be significantly higher than for a project for which new right-of-way is not acquired.

In addition, the extent of implementation of construction best management practices also can be dependent upon where a project is located. Each project, however, does have basic construction best management practices that must be implemented regardless of where a project is located (e.g., vehicle washout areas, storm drain protections).

While it is difficult to accurately project total storm water compliance costs, Caltrans has attempted to estimate and capture the costs of storm water compliance to assist in project planning. The estimating process was previously discussed in the section of the report addressing Caltrans implementation of a Project Planning and Design Guide. Caltrans provided data on construction site best management practices from a sample of projects and data on the implementation costs of different treatment best management practices (see Tables 13 and 14).

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**TABLE 13****Sample of Caltrans' Costs for Temporary Construction Site BMPs**

Temporary Construction Site BMPs		
Project	(Percentage of Total Project Cost)	Total Project Cost
01-296704	1.00%	\$22,591,878
01-301703	0.59%	\$17,534,000
03-291004	0.71%	\$32,500,000
03-1A46U4	0.96%	\$11,207,412
04-253804	0.66%	\$28,384,625
04-120614	1.40%	\$39,460,000
04-254804	1.43%	\$3,136,006
04-2285U4	1.52%	\$31,954,607
04-2357A4	2.15%	\$26,373,265
04-1S2604	3.08%	\$2,500,000
04-1S7914	3.18%	\$414,585
04-045064	4.12%	\$714,999
04-1S2604	5.34%	\$1,333,362
06-397604	2.16%	\$4,159,000
06-404304	4.53%	\$1,171,140
06-4100U4	0.04%	\$3,573,421
06-431504	2.67%	\$1,491,703
10-3404U3	1.23%	\$41,000,000
10-2A50U4	2.15%	\$2,642,400
08-483754	0.95%	\$3,712,172
11-232404	1.44%	\$1,431,931
11-232604	1.89%	\$16,255,000

As can be seen from the sample in Table 13, the percentage of total project cost for construction site best management practices can vary from less than 1 percent to more than 5 percent. The larger the project, in general, the smaller the percentage of total cost is for construction site best management practices. Although the percentage may be small, the total dollar amount can be significant. In addition, these costs are only for construction

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site best management practices and do not include treatment best management practices, maintenance best management practice costs, or other design best management practices. Implementing construction best management practices can be costly and varies greatly among projects. Generally, a large project will incur greater construction best management practices cost than a smaller project.

The costs for constructing permanent treatment best management practices can be significant. Caltrans supplied Table 14 that provides information on the costs per lane mile for constructing treatment best management practices. The costs do not include any costs associated with right-of-way acquisitions that may have been required to implement the treatment best management practice. Depending upon the type of permanent treatment best management practice used and the number of lane miles, the additional cost for constructing permanent best management practices for a project can be significant.

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**TABLE 14**

### **Costs for Constructing Treatment BMPs\***

<b>Treatment BMP Technology</b>	<b>Number of Projects using Technology</b>	<b>Permanent Treatment BMPs(Cost per Lane Mile)</b>	<b>Treatment BMP Status (Approved / Pilot Technology)</b>
Delaware Sand Filter	1	\$645,000	Pilot Technology
Multi-Chamber Treatment Train	2	\$155,000	Pilot Technology
Wet Basin	1	\$495,000	Pilot Technology
Oil-Water Separator	1	\$470,000	Pilot Technology
Austin Sand Filter	5	\$375,000	Pilot Technology
Infiltration Trench	2	\$360,000	Pilot Technology
Storm Filter	1	\$290,000	Pilot Technology
Biofiltration Swales	6	\$175,000	Approved Technology
Unlined Detention Basin	5	\$160,000	Approved Technology
Biofiltration Strips	3	\$155,000	Approved Technology
Infiltration Basins	2	\$120,000	Approved Technology

\*Does not include costs associated with right-of-way acquisitions.

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